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SCIENCE & TECHNOLOGY

USSR: LIFE SCIENCES

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ELECTRON CYTOCHEMICAL DETECTION OF Ca^{2+} -ATPase IN PROTONEMA OF MOSS FUNARIA
HYGROMETRICA (H e d w.) UNDER HYPOGRAVITATION

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 21, No 1, Jan-Feb 87
(manuscript received 25 Oct 85) pp 3-6

[Article by Ye. M. Nedukha, Institute of Botany, Ukrainian Academy of Sciences,
Kiev]

[Abstract] A study is made of the localization of Ca^{2+} -ATPase in the cells of the protonema of funaria hygrometrica grown in a clinostat to assist in predicting the possibility of existence and adaptation of plants to weightlessness. Electron cytochemical studies of subapical protonema cells of funaria hygrometrica revealed localization of irregularly-shaped electron-dense granules with morphology corresponding to the product of a cytochemical reaction. There was no ATPase activity in the plasmalemma of cells growing in the clinostat, apparently a result of disrupted functioning of the plasmalemma. Ca^{2+} -ATPase did manifest activity with the cytoplasmic membranes in the clinostat. References 20: 6 Russian, 14 Western.

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COMPARATIVE ANATOMIC ANALYSIS OF SEEDLING ORGANS OF PISUM SATIVUM (FABACEAE)
CULTIVATED UNDER SPACE FLIGHT CONDITIONS

Leningrad BOTANICHESKIY ZHURNAL in Russian Vol 72, No 5, May 87
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[Article by Z. A. Novruzova, A. A. Aliyev, U. K. Alekperov, A. L. Mashinskiy,
N. M. Chapari and G. K. Ragimova, Institute of Botany imeni V. L. Komarov,
AzSSR Academy of Sciences, Baku]

[Abstract] A morphologic-anatomic study was performed of 29-day seedlings of Pisum sativum L cultivated on board the Salyut-7 spacecraft as a part

of the "Oazis 1-AM" program and on control seedlings grown on Earth under similar conditions of temperature, humidity and illumination. Analysis of the basic anatomic elements, leaf, stem and root, showed quantitative and slight qualitative differences among experimental specimens, probably a response of the plants to their growth conditions. The experimental conditions did not modify the development of the structural elements of the organs. Differences were found only in the degree of sclerification of cells in the conducting bundles of the stem. References: 5 Russian.

6508/12955
CSO: 1840/846

UDC 547.686.355:581.143.23:582.736

INFLUENCE OF FLUORANTHENE DERIVATIVES ON MITOTIC ACTIVITY OF LEGUMINIOUS SEEDS

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 21, No 2, Mar-Apr 87
(manuscript received 17 Dec 85) pp 95-97

[Article by Ye. I. Korobko and V. M. Zinchenko, Mellitop Pedagogic Institute]

[Abstract] The use of various biologically active substances to stimulate growth and other physiological processes in plants, including substances increasing mitotic activity, is an important means of increasing agricultural yield. This article studies the influence of fluoranthene derivatives on mitotic activity in rootlets of germinating legume seeds. Treatment of pea seeds with a solution of 4-iodo-9-aminofluoranthene-3-sulfoacid, 0.1%, caused a reliable increase in the rate of meristem cell division. Treatment at 0.3 and 0.5% concentrations decreased mitotic activity. Treatment of soy seeds yielded similar results. Figures 2, references: 3 Russian.

6508/12955
CSO: 1840/840

UDC 576.335:576.356:635.21

CHROMOSOMAL VARIABILITY OF POTATO PROTOCLONES

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 21, No 2, Mar-Apr 87
(manuscript received 11 Dec 85) pp 105-108

[Article by E. D. Zhila, A. A. Kuchko and V. A. Sidorov, UkSSR Scientific Research Institute of the Potato Industry, Nemeshayeva, Kiev Oblast; Institute of Botany, UkSSR Academy of Sciences, Kiev]

[Abstract] Recent studies have shown great phenotypic variability among potato plants produced through cultures in vitro, particularly those regenerated from protoplasts. In 1981, the authors produced somaclonal variants--protoclones of potato varieties through culture of isolated protoplasts. Three-year field evaluation of phenotypic variability and economic value

of this material was undertaken. This article reports a cytogenetic study of a number of protoclonal lines following long-term vegetative reproduction. The results indicate a high degree of cytogenetic heterogeneity of the protoclonal lines obtained. The population of plants consists of triploids, tetraploids, aneuploids with two modal classes of 35-38 and 52-56 chromosomes, as well as mixoploid individuals with 30-98 chromosomes. Cytologic studies have shown that the variety used (Zarevo) is an initial explantate with high morphogenetic potential. Figures 3, references 21: 4 Russian, 17 Western.

6508/12955
CSO: 1840/840

UDC 595.7:591.617

QUANTITATIVE EVALUATION OF EFFECTIVENESS OF ENTOMOPHAGES UPON MASS RELEASE FOR BIOLOGICAL CONTROL OF HARMFUL INSECTS

Moscow ZOOLOGICHESKIY ZHURNAL in Russian, Vol 66, No 4, Apr 87
(manuscript received 14 Jul 86) pp 522-532

[Article by A. A. Sharov and A. K. Akhatov, Department of Biology, Moscow State University; All-Russian Republic Plant Protection Station (Moscow oblast)]

[Abstract] A review is presented of suggested criteria for evaluating the effectiveness of entomophages. It is suggested that the ratio--of initial density of the pest to minimum density of entomophages released wherein the density of the pest drops below the economic threshold in a certain period of time with a certain probability--be used as an integral effectiveness indicator. This indicator can solve the problem of quantitative evaluation of the effectiveness of entomophages when released in large masses for biological pest control. The procedure for determining the indicator is outlined and an equation is presented for the purpose. Figure 1, references 22: 11 Russian, 11 Western.

6508/12955
CSO: 1840/847

POSSIBILITIES OF POLLEN BREEDING OF PLANTS FOR RESISTANCE TO PATHOGENS

Kishinev IZVESTIYA AKADEMII NAUK MOLDAVSKOY SSR: SERIYA BIOLOGICHESKIKH I KHIMICHESKIKH NAUK in Russian No 5, Sep-Oct 86 (manuscript received 17 Mar 86) pp 3-6

[Article by N. N. Balashova, O. B. Darakov, N. Ye. Gordey and A. I. Suruzhiu]

[Abstract] There are many methods for breeding plants resistant to pathogens; gene transfer from wild forms to cultivated ones, genome transformation,

selection of resistant cells, development of resistant mutants. Pollen breeding is based on selection of pollen with the desired properties, pollination of the plant and production of a new generation with expression of these properties. Genes of sporolytic generation should be expressed at the stage of male gametophyte. One of the interesting characteristics of gametophytic breeding is that the haploid genome does not recognize dominant-recessive relations. Genetic variability is very important in this type of breeding, hence wild cultures are often used to insert new properties. Inbreeding on a world-wide scale could lead to catastrophic results. Pollen breeding however is not applicable to polyploid plants; one cannot predict with which genes it can be used. Literature data are scarce on the subject of the correlation between resistance of plants to various disease pathogens and pollen to toxins of these pathogens. Stability of gametophytes to phytotoxins, thus far, is used only as a test system in determining stability of the sporophytes. Only recently, some empirical rules were developed for immunity breeding using toxins. Currently, pollen breeding is limited to evaluation of plants by their gametophytes. References 22: 7 Russian, 15 Western (1 by Russian author).

7813/12955
CSO: 1840/826

UDC 581.15:581.143.6:631.527

REGENERATION OF PLANTS IN A CULTURE OF SORGHUM HAPLOID SOMATIC TISSUE

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 21, No 1, Jan-Feb 87
(manuscript received 29 Jul 85) pp 18-22

[Article by L. A. Elkonin, V. S. Tyrnov, M. I. Tsvetova and A. G. Ishin, "Elita Povolzhya" Scientific-Production Association, Saratov; Saratov University]

[Abstract] This article reports on the production of isolated cultures with morphogenetic activity from sorghum haploid, capable of massive formation of diploid regenerant plants. The possibility is demonstrated of forming isolated cultures capable of stable regeneration over more than one year from sorghum haploid somatic tissue. In a number of characteristics, including morphogenetic potential, sensitivity to phytohormonal composition of nutrient medium and intensity of proliferation, there are no differences between haploid and diploid origin cultures. Conditions are developed for massive production of autodiploid regenerant plant material in a sorghum haploid tissue culture. Figure 1, references 10: 3 Russian, 7 Western.

6508/12955
CSO: 1840/839

COMPARISON OF EFFECTIVENESS OF POTATO EVALUATION IN RESPECT TO ITS RESISTANCE TO EARLY DRY SPOT DISEASE INFECTED NATURALLY AND ARTIFICIALLY

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 9, Sep 86
(manuscript received 20 Jan 86) pp 85-88

[Article by V. G. Ivanyuk, Belorussian Scientific Research Institute of Potato and Vegetable Growing, Samokhvalovich, Minskaya Oblast]

[Abstract] Extensive field evaluations showed that various brands of potatoes differed in their resistance to early dry spot disease. A direct correlation was established between the diameter of the spots developed upon infection, the intensity of sporulation of the corresponding pathogen, development of the disease and the degree of damage. Correlation between the incubation period and potato resistance was weak. With either the natural or artificial infection, it is adequate to determine the intensity of sporulation or the dimensions of affected segments to evaluate various potato brands. References: 6 Russian.

7813/12955
CSO: 1840/1082

UDC 615.779.934:635.25

ACTIVE MECHANISMS OF ONION IMMUNITY

Kiev FIZIOLOGIYA I BIOKHIMIYA KULTURNYKH RASTENIY in Russian Vol 18,
No 5, Sep-Oct 86 (manuscript received 14 Mar 86) pp 452-459

[Article by A. P. Dmitriyev, L. A. Tverskoy and D. M. Grodzinskiy, Institute of Plant Physiology, UkSSR Academy of Sciences, Kiev]

[Abstract] Studies were conducted on the mechanisms involved in phytoimmunity, using Strigunovskiy-Nosovskiy onion epidermal cells. The in vitro studies showed that infection with fungal spores led to thickening of the cell wall and the formation of cytoplasmic granules containing phenolic phytoalexins. Nonspecific pathogens (*F. solani*, *B. cinerea*), against which the onion displays species-specific immunity, induce markedly more fungicidal compounds than specific (*B. allii*) or nonpathogenic (*M. Fructigena*) fungi. Thin-layer chromatography on silica gel led to the identification of 6 flavonoid compounds, 3 of which were present in trace amounts. Excellent elution was obtained with the following solvent systems: chloroform: 96% ethanol: hexane = 3:1:3; chloroform:methanol = 97:3; and benzene:ethanol = 95:5. Figures 7, references 17: 12 Russian, 5 Western.

12172/12955
CSO: 1840/822

DIALLEL ANALYSIS OF CORN POLY-COB FORMATION MARKER

Kishinev IZVESTIYA AKADEMII NAUK MOLDAVSKOY SSR, SERIYA BIOLOGICHESKIYE
I KHIMICHESKIKH NAUK in Russian No 6, Nov-Dec 86 (manuscript received
14 Oct 85) pp 24-28

[Article by S. T. Chalyk]

[Abstract] Successful breeding of corn yielded hybrids in recent years capable of producing over 100 hundred-weights per hectare. However such results are possible only under favorable conditions. New hybrids are needed which would be productive under any conditions. One of the ways to achieve this is by developing poly-cob plants. Genetic analysis of poly-cob formation marker was performed in a system of diallel crossing to determine the ability of self-pollinated lines to yield hybrid offspring with high values of this marker. The experiments showed that dominant genes of the starting lines determine the formation of one cob of the plant. Multi-cob formation is a recessive characteristic, therefore, in developing corn hybrids with more than one cob on a stem parent lines must be selected with high value of this marker. During formation of multiple cobs the interaction of genotypes with surrounding milieu is manifested. The relationship between the dominant and recessive genes varies with changes in external environment. Among the lines evaluated by the diallel method, the highest number of recessive allele were shown by T34 and R71 lines. They also exhibited the highest level of combination ability in respect to the number of cobs per 100 plants. These lines should be used in producing poly-cob corn hybrids. Figure 1, references 8: 5 Russian, 3 Western.

7813/12955
CSO: 1840/761

UDC 633.11"324":631.524.85

BREEDING OF WINTER WHEAT FOR FROST RESISTANCE

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 3, May-Jun 86, pp 13-15

[Article by N. V. Tupitsin]

[Abstract] A review is presented of some of the newer approaches to breeding winter wheat for high frost-resistance, taking into consideration that over the preceding 20-30 years frost resistance of new varieties has been on the decrease in most cases. This phenomenon is in part based on the inverse relationship between harvests and frost resistance in winter wheat, with the net effect that the frost resistance traits of varieties commonly used in breeding programs have been spent. For this reason, transgressive breeding is being advanced as one of the more progressive approaches to the creation of novel varieties combining high yields and frost resistance. This method requires that the genetic adaptation systems to low temperatures in the parental varieties differ, and yet be capable of recombination.

Generally, transgressive breeding relies on gliadin markers to monitor the first and the sixth chromosomal groups. However, the current feeling is that the system should be expanded to encompass other genetic, biochemical, and physiological markers of frost resistance. Figures 1.

12172/12955
CSO: 1840/820

UDC 633.11"321":631.527.42

ISOGENIC LINES OF SPRING WHEAT AND THEIR EFFICIENT USE

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 3, May-Jun 86, pp 18-19

[Article by S. F. Koval, candidate of biological sciences, Institute of Cytology and Genetics, Siberian Department, USSR Academy of Sciences]

[Abstract] A discussion is presented of the use of isogenic lines of spring wheat for crop improvement. The advantage of this approach lies in the fact that, after 8-9 saturation backcrosses, virtually complete identity can be obtained between the isogenic line and the parental variety in terms of all the parameters, except the introduced donor trait and its pleiotropic effects. Tabular data are presented on selected lines of the isogenic Novosibirsk 67 spring wheat, with further developments in progress at the Institute of Cytology and Genetics. Additional improvements and creation of novel isogenic Novosibirsk 67 lines are based on the introduction into the genotype of traits for frost resistance, early maturation, spike density, grain size, etc.

12172/12955
CSO: 1840/820

UDC 631.527:681.142

USING COMPUTERS IN SELECTION OF POTATO BREEDING PAIRS

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 3, May-Jun 86, pp 19-21

[Article by B. N. Dorozhkin, F. N. Kildibekova and V. I. Kadychegova, Siberian Scientific Research Institute of Agriculture]

[Abstract] Description is provided for using a computer program in selection of suitable parental varieties in breeding potatoes, relying on the selection of two mutually complementary traits. The analysis was based on 12 common traits (e.g., productivity, starch content, skin color, etc.), showing additive inheritance. Comparison of the breeding results showed that the computer approach constitutes a promising modality, taking into consideration the subjective factors in selecting traits for analysis. It would appear that a computer-based empirical approach such as the one applied to potatoes may also be applicable to other crops.

12172/12955
CSO: 1840/820

BREEDING OF CORN FOR IMMUNITY AGAINST DISEASE AND PESTS

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 3, May-Jun 86, pp 22-24

[Article by N. B. Navrotskaya, P. V. Inglik and B. V. Chizmar, Transcarpathian Agricultural Experimental Station]

[Abstract] A description is provided of corn breeding practices at the Station, with particular reference to testing under field conditions for resistance to pests and diseases. The use of natural field conditions offers a number of advantages over artificial infections and deliberate exposures to pests, the primary advantage of which is that a realistic assessment of pure lines and hybrids is obtained. This practice has resulted in the creation of a gene bank representing a number of corn varieties with high resistance to diseases and pests, which is presently represented by 115 corn lines. Two varieties, Zakarpatskiy 100TV and 101MV, have been undergoing state trials since 1984. Tables 2.

12172/12955

CSO: 1840/820

UDC 551.243.8.001.14

TRICHODERMA LIGNORUM AS ANTAGONIST AND HYPERPARASITE OF PHYTOPATHOGENIC FUNGI

Alma-Ata VESTNIK AKADEMII NAUK KAZAKHSKOY SSR in Russian No 12, Dec 86, pp 47-51

[Article by K. A. Tulemisova, A. K. Uspanov, L. M. Amirkhanova and N. Ye. Bekmakhanova]

[Abstract] Trials were conducted with 34 strains of *Trichoderma lignorum* to identify isolates demonstrating antagonistic and hyperparasitic relationships vis-a-vis phytopathogenic fungi. The studies resulted in the identification of 11 strains showing antagonistic activity, and 8 varieties clearly demonstrating hyperparasitism. The latter consisted of the capacity of the *T. lignorum* strains to form colonies on colonies of the target fungi, in effect using the latter as nutrient medium. The phytopathogenic fungi identified as being susceptible to parasitization by *T. lignorum* included, among others, *Botrytis cinerea*, *Sclerotinia sclerotiorum*, *Fusarium sporotrichiella* and *Rhizoctonia violacea*. Figures 1, references 6: 5 Russian, 1 Western.

12172/12955

CSO: 1840/805

ASSOCIATION BETWEEN NITROGEN-FIXING CLOSTRIDIA AND SPRING WHEAT

Moscow IZVESTIYA TIMIRYAZEVSКОЙ SELSKOKHOZYAYSTVENNOY AKADEMII in Russian
No 6, Nov-Dec 86 (manuscript received 7 Jul 86) pp 122-128

[Article by M. I. Chumakov, L. Yu. Ivanova, M. Kh. Bruk, L. Ye. Kotlyar
and V. T. Yemtsev, Chair of Microbiology]

[Abstract] A study was conducted to determine whether free-living nitrogen-fixing Clostridia commonly encountered in soil samples form associations with spring wheat roots. Evaluation of the root system of Yershovskaya 32 wheat and assessment of metabolic, physiologic, and crop yield parameters demonstrated a positive correlation. The Clostridia were isolated from the roots (approaching 26500 cells/g), with washing studies demonstrating a very firm adherence. Evaluation of root homogenates resulted in the demonstrated of counts approaching 2100/g. These observations point to the fact that the Clostridia may have a physiological role as microsymbionts in spring wheat. In addition, a number of other unidentified nitrogen-fixing bacteria were also shown to exist under similar circumstances in close association with the root system. References 24: 15 Russian, 9 Western.

12172/12955
CSO: 1840/821

HERBICIDE EFFECTS ON VARIABILITY IN GRAIN CROPS

Moscow IZVESTIYA TIMIRYAZEVSКОЙ SELSKOKHOZYAYSTVENNOY AKADEMII in Russian
No 2, Mar-Apr 86 (manuscript received 10 Sep 85) pp 13-26

[Article by V. A. Zinchenko, Chair of Chemical Plant Protection]

[Abstract] A review is presented of the effects of annual treatment of grain crops with the herbicides 2,4-D, tordon 22K, and banvel-D. The data were analyzed in terms of a number of physiological, metabolic, and morphological parameters, as well as in consideration of resistance to herbicides. Intensive exposure to the herbicides was seen to narrow the scope of variability in all parameters, including responsiveness to fertilizers and susceptibility to herbicides. The long-term-effects of repeated exposure to the herbicides were attributed to alterations in the phytohormonal system of the plants. Figures 2, references 41: 1 Polish, 40 Russian.

12172/12955
CSO: 1840/1116

FORMATION OF MITOCHONDRIA IN CEREAL SHOOTS AT LOW TEMPERATURES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian
No 2, Mar-Apr 87 (manuscript received 25 Feb 85) pp 264-271

[Article by L. P. Cheltsova, All-Union Scientific Research Institute of
Applied Molecular Biology and Genetics, Moscow]

[Abstract] The effects of long-term (0-50 days) vernalization at 2°C on mitochondria were studied in the case of wheat, rye and triticale, using differential centrifugation to estimate the mitochondrial fraction in mg/g dry tissue. Vernalization was shown to increase the mitochondrial fraction of shoots, with a maximum increase seen after 20-30 days of vernalization. The increases were equally pronounced in the winter and spring varieties. In addition, vernalized shoots yielded mitochondrial preparations that showed no significant differences in swelling and contraction in KCl solutions at 2 or 27°C. Mitochondria from unvernallized plants had very limited capacity for contraction at 2°C. These facts were interpreted to indicate that mitochondria of vernalized crops retain full functional characteristics at both low and high temperatures. Figures 4, references 11: 1 Serbian, 5 Russian, 5 Western.

12172/12955
CSO: 1840/854

UDC 632.911

EFFECTS OF MICROBIAL PREPARATIONS ON COLORADO POTATO BEETLE EGGS

Vilnius TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V -- BIOLOGICHESKIYE
NAUKI in Russian No 1, Jan-Mar 87 (manuscript received 28 May 85) pp 47-51

[Article by I. S. Bartninkayte, Institute of Zoology and Parasitology,
Lithuanian SSR Academy of Sciences]

[Abstract] Trials were conducted on the susceptibility of Colorado potato beetle eggs and larvae to bitoxybacillin (BTB-202) and entobacterin, with a view toward evaluation of these agents for suitability in biological control measures against the Colorado beetle. BTB-202, sprayed in concentrations of 0.5-1%, led to death of 88.3-99.4% of the larvae, while bacterin was effective in killing only 26.9-34.2% of the larvae. The efficacy of BTB-202 was attributed to the presence in the preparation of a heat-stable exotoxin that penetrated into the eggs within 2 h of application, resulting in a killing rate of 8.1-13.8%. BTB-202 was thus shown to be the more promising agent for field trials, with the additional advantage that rains, occurring 2 h after application, could be expected to have no effect on egg destruction. References 11 (Russian).

12172/12955
CSO: 1840/825

EVALUATION OF SOVIET COMMERCIAL ANTISERA AGAINST POTATO VIRUSES IN ELISA AND VIROBACTERIAL AGGLUTINATION TESTS

Moscow IZVESTIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKAYA in Russian
No 1, Jan-Feb 87 (manuscript received 16 Jan 85) pp 28-34

[Article by A. F. Bobkova, N. M. Natsvlshvili, S. N. Chirkov, N. A. Surgucheva, Yu. A. Varitsev and I. G. Atabekov, Institute of Microbiology, USSR Academy of Sciences, Moscow]

[Abstract] A wide spectrum of Soviet commercial antisera against potato viruses were evaluated in ELISA and virobacterial agglutination tests [Chirkov, SN, S.-kh. Biologiya, 18(5): 42, 1983]. The results demonstrated that most of the antisera were unsuitable for the ELISA test due to lack of specificity and presence of excessive levels of antibodies against plant components. As a result, acceptable levels of specificity and sensitivity could not be obtained with the ELISA systems. However, the antisera were found to be suitable for the virobacterial agglutination tests, giving sensitivities on the order of 0.05-0.65 $\mu\text{m}/\text{ml}$ virus. Figures 4, references 8: 6 Russian, 2 Western.

12172/12955
CSO: 1840/853

USE OF QUALITATIVE CHARACTERISTICS FOR LONG-TERM WINTER WHEAT BROWN FORECASTING

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 21, No 1, Jan-Feb 87
(manuscript received 21 Feb 86) pp 56-59

[Article by I. I. Minkevich and T. I. Zakharova, Wood Technology Academy imeni S. M. Korov; All-Union Institute of Plant Protection, Leningrad]

[Abstract] In order to allow the use of predictors and predictants of comparable accuracy in the generation of long-term winter-wheat brown-rust forecasts, the authors suggest that data on appearance of plant diseases be expressed considering the quality of the information as follows: 0 - dispersion or moderate development of disease throughout an area or in foci; 1 - moderate development of the disease with epiphytotic foci; 2 - epiphytotic development over an entire region or in foci of moderate development. Weather data should also be converted to a point scale. The principle of selecting long-term seasonal phytopathology predictors based on qualitative characteristics was developed on the basis of data on winter-wheat brown-rust in the forested steppe zone of the Ukraine. It was found that total precipitation was of greatest value in brown-rust forecasting. The sum of mean monthly air temperatures is significant only in the stage

of regeneration of the infection. High temperatures delay development of the disease. References: 6 Russian.

6508/12955
CSO: 1840/838

UDC 581.1.132.032.582.661

PHYSIOLOGIC SIGNIFICANCE OF ETHYLENE IN YELLOW RUST-INFECTED WHEAT

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 2, Mar-Apr 87
(manuscript received 14 Apr 86) pp 23-26

[Article by N. M. Eydelnant, I. V. Yesipova, A. K. Demurina and L. I. Kryukova, Central Asian Scientific Research Institute of Phytopathology]

[Abstract] The physiologic role of ethylene in yellow rust infection of Kyzyl Shark was assessed in terms of the effects exerted by Ethrel and CoCl_2 , agents that, respectively, stimulate and inhibit ethylene synthesis in plants. Paradoxically, both were seen to increase the resistance of Kyzyl Shark wheat to infection by the pathogen. The effects of CoCl_2 were attributed to the fact that this chemical, by inhibiting ethylene production, limited penetration of the fungus into the cells since high levels of ethylene increase cell wall permeability. In in vitro studies both agents inhibited spore germination, and both favored an increase in the synthesis of cytokinins in infected cells. The latter corrected hormonal imbalance in infected plants since infection with the yellow rust pathogen led to a significant depression of cytokinin synthesis and markedly depressed cytokinin:abscissic acid ratios. References 6: 3 Russian, 3 Western.

12172/12955
CSO: 1840/859

UDC 633.11:575.42

USE OF SAMPLES FROM PLANT HUSBANDRY INSTITUTE COLLECTION FOR BREEDING HEAT-RESISTANT WHEAT

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 2, Mar-Apr 87
(manuscript received 8 May 84) pp 52-57

[Article by S. Kh. Odilov and Ye. I. Bessonova, Uzbek Scientific Research Institute of Grain]

[Abstract] Wheat seed obtained from the VIR [All-Union Institute of Plant Husbandry] collections were used in a breeding program designed to produce wheat varieties with high heat tolerance suitable for cultivation in Uzbekistan (40-45°C). The plants were selected for statolith starch content, coagulation temperature of water-soluble proteins, seed weight,

etc. The F_1 and F_2 generations were characterized by higher concentrations of statolithic starch and higher coagulation temperatures for the soluble proteins than the parental forms, indicating the partial dominance of these traits. Segregation in F_3 and $F_3 B_3$ into lines with high and low heat tolerance corresponded to 3:1, demonstrating that heat resistance was controlled by a single gene or a closely linked complex. A segregation ratio of 1:1 in B_1 suggested multigenic control. Four donors of heat- and drought-resistance were identified, which led to the breeding of 155 hybrid lines characterized by high productivity and resistance to lodging and rust fungi.

12172/12955
CSO: 1840/859

UDC 581.2.623.3.23

DISTRIBUTION OF ANTITUMOR COMPOUND D IN PLANT TISSUES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian
No 3, May-Jun 87 (manuscript received 24 Mar 84) pp 473-476

[Article by I. A. Degtyarev, L. V. Vakhnina, K. N. Popov, N. N. Zoz and A. A. Buzukov, Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] Tritium labeled compound D, a lipophilic phenolic antitumor agent, was monitored for its distribution in normal and gall-ridden tissues of plants. Galls were induced by infection of pea plants with *Agrobacterium tumefaciens*. The data showed that over a 2-3 days period compound D became distributed throughout the plant, including the gall tissue. In addition, extraction studies demonstrated at least partial metabolism of the compound in the plant tissues. Tables 2; references: 5 Russian.

12172/12955
CSO: 1840/855

UDC 576.11+577.1

PHOTOCHEMICAL CONVERSION OF NUCLEIC ACID COMPONENTS CATALYZED BY LUNAR SOIL

Leningrad ZHURNAL EVOLYUTIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 23,
No 1, Jan-Feb 87 (manuscript received 7 Jun 85) pp 3-8

[Article by Ye. A. Kuzicheva, Institute of Cytology, USSR Academy of Sciences,
Leningrad]

[Abstract] An assessment was conducted on the effects of lunar soil on photochemical transformation of uridine and uracil in the absence of oxygen, and comparison with the effects obtained with a synthetic analog of lunar soil. Studies with 150 μm thick films of uracil and uridine with an exposure surface area of 175 cm^2 over the lunar regolite samples collected by the Luna-16 mission from the Sea of Fertility showed enhanced UV photolysis. The quantum yields for uracil photolysis (254 nm, $64.3 \times 10^4 \text{ J/m}^2$) with and without the regolite were 0.32×10^{-3} and 0.2×10^{-2} , respectively. The corresponding figures for uridine with and without the lunar sample were 0.13×10^{-3} and 0.11×10^{-3} . A mixture of metal oxides designed to simulate the lunar soil sample was ineffective as a catalyst of photolysis; however, a sample of SiO_2 showed limited activity. Spectral and chromatographic analysis of UV-irradiated uracil samples on the lunar soil demonstrated the formation of a more complex but undefined molecular structures. Figures 3; references 15: 12 Russian, 3 Western.

12172/12955

CSO: 1840/813

MODELING OF ABIOGENIC SYNTHESIS OF AMPHIPHILIC MOLECULES AND PROTOMEMBRANE FORMATION MECHANISMS

Leningrad ZHURNAL EVOLYUTIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 23, No 1, Jan-Feb 87 (manuscript received 15 Jan 85) pp 9-15

[Article by M. K. Shvedova, A. V. Goryunov, I. I. Engbrekht, S. A. Seleznev and A. I. Mikhaylov, Chernogolovka Department, Institute of Chemical Physics, USSR Academy of Sciences, Moscow Oblast; Medical Institute, Tselinograd]

[Abstract] A model prebiotic system was designed to study the process of amphiphilic molecule formation on a water surface, consisting of UV photochemical transformation of hexadecane into carbonyl compounds. The studies, conducted over a temperature range of 20-50°C and utilizing ESR analysis, demonstrated the appearance of carbonyl and carboxyl amphiphilic surfactants forming a monolayer at the air/water interface. The reaction mechanism involved the appearance of a free radical center near the hydrocarbon chain terminus, resulting in the formation of an oxygen-containing group. Surface tension measurements revealed that as the surfactant monolayer accumulated with time, segments ingressed the water bulk forming micelle-like structures. The latter step is presumed to model early stages of protomembrane formation in primeval oceans. Figures 5, references 9: 2 Russian, 7 Western.

12172/12955
CSO: 1840/813

UDC 612.111.4:616.981.31

CHANGE IN ION COMPOSITION AND FORM OF ERYTHROCYTES UNDER INFLUENCE OF CHOLERA TOXIN

Leningrad ARKHIV ANATOMII, FISTOLOGII I EMBRIOLOGII in Russian, Vol 92, No 1, Jan 87 (manuscript received 18 Sep 86) pp 50-52

[Article by V. A. Shakhlamov and S. V. Buravkov, Laboratory of Electron Microscopy and Cell Pathology (Headed by Professor V. A. Shakhlamov), Institute of Human Morphology, USSR Academy of Medical Sciences, Moscow]

[Abstract] The cholera toxin acts on ion transport in small intestine epitheliocytes indirectly through cyclic adenosine monophosphate (cAMP). This article studies the effect of a filtrate of a *V. cholerae* culture on rat erythrocytes in vitro. The cholera toxin, acting on the plasmalemma of the erythrocytes, directly causes molecular shifts in the plasmalemma, leading to changes in the ion composition of the cell, then to changes in cell shape, without the participation of the cell cyclase systems. References 7: 5 Russian, 2 Western.

6508/12955
CSO: 1840/844

ULTRASTRUCTURE OF LYMPHOID ORGAN LYMPHOCYTES AFTER CRYOCONSERVATION WITH PEO-400 PROTECTION

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 21, No 1, Jan-Feb 87
(manuscript received 6 Aug 85) pp 6-9

[Article by T. P. Govorukha and T. N. Voskoboynikova, Institute of Problems of Cryobiology and Cryomedicine, Ukrainian SSR Academy of Sciences, Kharkov]

[Abstract] The use of lymphoid tissue to correct immunodeficient states requires reserves of donor material and effective methods of its storage. DMSO and polyethylene oxide (PEO) are used for this purpose. This article studies the changes in the ultrastructural organization of BALB/c mouse line lymphoid cells during cryoconservation with protection by 10% PEO-400 solution. Electron-microscope studies demonstrate that incubation with 10% PEO-400 for 15 minutes prior to freezing and thawing resulted in some changes to the cytoplasmic membrane structures of the cells: Swelling of mitochondria, expanded perinuclear space and network of endoplasmic reticulum. Some cells undergo more significant changes, with complete separation of the cytoplasm from the nucleus. The changes appear to be reversible during warming, with more favorable results achieved by temperature pauses during freezing. References 10: 9 Russian, 1 Western.

6508/12955
CSO: 1840/839

UDC 616.153.1:577.152.344.042.2]-074

BIOFLUORESCENT DETERMINATION OF ANTIPROTEASE ACTIVITY

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 11,
Nov 86 (manuscript received 17 Jul 84) pp 629-631

[Article by I. I. Gitelzon, S. A. Rykov, G. A. Kratasyuk, V. N. Petushkov and A. G. Shvetskiy, Laboratory of Photobiology, Institute of Biophysics, Siberian Department, USSR Academy of Sciences; Chair of Intramural Surgery, 4th Course, Krasnoyarsk Medical Institute]

[Abstract] A biofluorescent method has been devised for the ready and convenient determination of antiprotease activity, relying on the proteolytic destruction of bacterial luciferase by trypsin. The basic steps include incubation of the antiprotease factor (donor plasma, gordonox, or contrical) with trypsin for 1-2 min at 30°C, followed by the addition of this mixture to a solution containing predetermined amounts of Photobacterium leiognathi luciferase along with its cofactors and substrate. Biofluorescence is measured for 1 min, and is predicated on the degree of residual trypsin activity. This technique was used successfully in determining antiprotease activities in the plasma of patients with various surgically managed

pathologies. The technique was proven to be simple and sensitive, with a sensitivity level of 100 ng of antiprotease activity. Figures 3, references 15: 4 Russian, 11 Western.

12172/12955

CSO: 1840/1124

BRIEFS

MECHANICAL RESPIRATION--A series of new electrical breathing stimulators have been designed at the 1stra Branch of the USSR Research Institute of Electromechanics near Moscow. Unlike the conventional forced pulmonary ventilation apparatus, they are compact and cause no side-effects in long-term operation. Some of the stimulators are for use in hospitals and out-patient clinics, while the portable one will be found convenient for domestic use. The clinical tests at the Tuberculosis Research Institute of the Russian Federation's Ministry of Public Health confirmed their high effectiveness in treating chronic bronchitis and other respiratory diseases.

[Text] [Moscow SOVIET UNION in English No 4, Apr 1987 p 27] 12955

CSO: 1840/753E

UDC 575.155:612.6.052:665.4

ANTIMUTAGENIC EFFECTS OF STERICALLY-HINDERED PHENOLS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 2, Mar-Apr 87 (manuscript received 23 Sep 85) pp 298-301

[Article by Yu. V. Pashin, L. M. Bakhitova, T. I. Bentkhen, L. G. Plekhanova and V. V. Yershov, Institutes of General Genetics imeni N. I. Vavilov and of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] The effects of three sterically-hindered phenol derivatives -- phenozan acid, and its diglycolic and tetrapentaerythryl esters -- as antimutagens were evaluated on benz[a]pyrene-induced mutations. The test systems consisted of enumeration of micronuclei induced in vitro in Chinese hamster V-79 cells and the formation of polychromatophilic erythrocytes in bone marrow of F₁(CBA x C57Bl/6J) mice. All three derivatives were shown to be antimutagenic, with the activities of the esters exceeding that of the acid. The antimutagenic properties of these compounds may be attributed to their structural characteristics, including the presence of phenolic fragments that account for their antioxidant features. References 8: 6 Russian, 2 Western.

12172/12955

CSO: 1840/854

UDC 591.044.5:591.044.6

ENHANCEMENT OF HEMOLYTIC RESISTANCE OF ERYTHROCYTES WITH NITROGENOUS
HETEROCYCLIC COMPOUNDS

Moscow IZVESTIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKAYA in Russian
No 1, Jan-Feb 87 (manuscript received 18 Nov 83) pp 154-160

[Article by F. I. Braginskaya, K. Ye. Kruglyakova, L. D. Smirnov, O. M.
Zorina and T. T. Zhumabayeva, Institute of Chemical Physics, USSR Academy
of Sciences, Moscow]

[Abstract] A series of nitrogenous heterocyclic compounds were assessed for their ability to limit ultrasonic hemolysis of human erythrocytes in conjunction with their effects on membrane-bound acetylcholinesterase (AChE) activity. Compounds found to be most effective in preventing erythrocyte hemolysis were identified as alkyl-substituted pyrimidines and benzimidazole. The optimum concentration range for these compounds was on the order of 10^{-6} to 10^{-5} M. The concentration of these compounds required for 50% inhibition of AChE was on the order of 0.8-10 mM. These facts demonstrate that, in the concentrations in which they protect erythrocytes from hemolysis, they have no adverse affect on erythrocyte function, since much higher concentrations for AChE inactivation are required. Figures 4, references 15: 7 Russian, 8 Western.

12172/12955
CSO: 1840/853

UDC 576.8:575

GENETIC ENGINEERING OF COMMERCIALY IMPORTANT MICROORGANISMS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 3,
May-Jun 87 (manuscript received 10 Oct 86) pp 325-340

[Article by V. G. Debabov, All-Union Scientific Research Institute of
Genetics and Breeding of Industrial Microorganisms, Moscow]

[Abstract] A literature review is presented of advances in genetic engineering, particularly as they impact on microbial synthesis of desirable products. A summary is presented of the use of various microorganisms for the production of vitamins, enzymes, biological response modifiers, hormones, etc. Special efforts are being made to encompass additional bacterial genera as producers of various compounds, in addition to those now in common use. Under intensive development are new vector molecules for carrying and introducing desired DNA sequences into target microorganisms. Considerable research efforts are also underway to ensure gene amplification and efficient gene expression systems. Figures 4, references 43: 5 Russian, 38 Western.

12172/12955

CSO: 1840/855

UDC 631.7:416.8

EFFECTS OF ORGANOIODINE COMPOUNDS IN SOIL SOLUTIONS ON AVAILABILITY OF IODINE FOR PLANTS

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA. SERIYA 17: POCHVOVEDENIYE in Russian No 2, Apr-Jun 87 (manuscript received 2 Oct 86) pp 18-22

[Article by F. A. Tikhomirov and G. I. Agapkina]

[Abstract] Studies were conducted with different soil samples and I-125 to determine factors that affect iodine availability to plants. The I-125 levels in the different aqueous soil extracts ranked as follows: chernozem < chestnut < serozem < dernovo-podzolic < krasnozem. Virtually all of the iodine was present in the form of organoiodine compounds, differentiated by gel chromatography into the following MW fractions: $(1.1-1.3) \times 10^4$, $(2.0-2.1) \times 10^4$, and $(5.6-6.4) \times 10^4$. These fractions showed considerable differences in yielding iodine to 17-day old pea shoots, with iodine accumulation by the plants from the $(5.6-6.4) \times 10^4$ MM_w fraction exceeding the accumulation from the other fractions 5- to 10-fold. On this basis, the soil samples ranked as follows in terms of iodine accumulation by plants: dernovo-podzolic < chestnut < chernozem < krasnozem < serozem. Figures 1, references: 7 Russian.

12172/12955

CSO: 1840/824

UDC 595.323.4

DISCOVERY OF NESOKIA INDIKA IN GERBIL COLONY

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 3, May-Jun 86
(manuscript received 27 Jun 85) p 63

[Article by V. P. Promptov, S. F. Ustimenko and Z. A. Fomina, Anti plague
Station, Ministry of Communication]

[Abstract] The first case is reported of a discovery in Uzbekistan of a
Nesokia indika rat in a colony of gerbil, in a hilly area 25 km southeast
of Bukhara. The fur coat of the rat yielded a flea (Xenopsylla gerbilli)
commonly found on gerbils and responsible for plague transmission. The
close contact between the rat, that commonly resides in waterways and rural
areas with human habitation, opens up new aspects of plague epidemiology
in Uzbekistan. References: 1 Russian.

12172/12955
CSO: 1840/1122

UDC 576.851.48(477)

PATHOGENIC ESCHERICHIA ISOLATES IN UKRAINE

Kiev VRACHEBNOYE DELO in Russian No 7, Jul 86 (manuscript received 9 Jan 86)
pp 3-7

[Article by A. M. Kasyanenko, deputy minister, Ukrainian SSR Ministry of
Health]

[Abstract] Monitoring studies conducted between September 1983 and
September 1984 resulted in the isolation of 372 pathogenic Escherichia strains
in Ukraine; 220 strains were isolated from patients with acute intestinal
infections, and 152 strains were isolated from carriers. The isolates be-
longed to 23 serological groups, with the largest number of serological
groups isolated in the Donetsk Oblast. Serogroup 0111 accounted for 26.6%
of the isolates, serogroup 01 for 22.0%, 0151 for 9.7%, 025 for 2.2%, 055
for 1.1%, with serogroups 0126, 04, 0112, 0143, 015 and 075 responsible

for the remaining isolates. Of the total number of isolates, 68% were isolated in winter months (November-February). The highest percentage of isolates (28.5%) was provided by children up to 6 months of age, followed by the 6-12 month olds (11.5%), while the 21-30 years age group accounted for 15.5% of the isolates. The predominant pattern of escherichial infections was one of frank morbidity in children and a carrier state in the adults. Figures 2, references: 4 Russian.

12172/12955
CSO: 1840/1127

UDC 616.34-022

CAMPYLOBACTERIOSIS: REVIEW

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 6, Jun 86
(manuscript received 10 Mar 86) pp 51-56

[Article by A. A. Abidov, corresponding member, USSR Academy of Medical Sciences, Scientific Research Institute of Epidemiology, Microbiology and Infectious Diseases, Uzbek SSR Ministry of Health]

[Abstract] A review is presented of the clinical manifestations and cultural characteristics of campylobacteriosis, an infection that is diagnosed accurately in only 1% of the cases. The basic problem lies in the general unfamiliarity with the pathogen and a low index of suspicion. The general clinical features of infection with Campylobacter consists of chills, headache, loss of body weight, respiratory difficulties, and hepatic manifestations. The sequelae involved may involve phlebitis and cardiac signs and, in women, abortions or premature births. In uncomplicated campylobacteriosis the symptomatology is generally similar to that of brucellosis. Diabetes, cardiovascular diseases and alcoholism appear to predispose to campylobacter infections. Campylobacteriosis has been established to be transmitted sexually, as well by contact with animals. A number of antibiotics have been shown to be effective in the treatment of campylobacter infections, and new media are being developed for more reliable microbiologic diagnosis. References 27: 4 Russian, 23 Western.

12172/12955
CSO: 1840/1093

UDC 675.35.155:575.2.084.:254.2

GENETIC TRANSFORMATION OF SOMATIC CELLS. PART 13. LIMITED REPLICATION OF DNA, CONTAINING HUMAN III SATELLITE DNA FRAGMENT, IN MOUSE CELLS

Leningrad TSITOLOGIYA in Russian Vol 29, No 4, Apr 87 (manuscript received 20 Mar 86) pp 478-483

[Article by F. L. Vikhanskaya and N. V. Tomilin, Institute of Cytology, USSR Academy of Sciences, Leningrad]

[Abstract] A series of recombinant plasmids containing human III satellite DNA (SH3) with altered nucleotide sequence was constructed on the basis of the vector pCVSVL in order to produce direct proof of the presence in SH3 of a replicator. One of the plasmids also contained a synthetic fragment containing an adenovirus 5 genome nucleotide sequence strengthening the effectiveness of initiation of replication in vitro. The plasmids were introduced to cultivated hamster, human and mouse cells, then after a few days nonchromosomal DNA was extracted from the cells and used to transform *E. coli*. DpnI-resistant plasmids were found in mouse cells transformed with the v-myc oncogene after transient transfection with SH3-containing plasmids. MboI-sensitive plasmids were not found, indicating limited replication of SH3-containing plasmids in the transformed mouse cells. Figures 4, references 25: 3 Russian, 22 Western.

6508/12955
CSO: 1840/842

UDC 575.155:575.2.084::579.254.2

GENETIC TRANSFORMATION OF SOMATIC CELLS. PART 14. EXPRESSION OF GENE ENCODING SURFACE ANTIGEN OF HUMAN HEPATITIS B VIRUS IN MAMMALIAN CELLS

Leningrad TSITOLOGIYA in Russian Vol 29, No 4, Apr 87 (manuscript received 20 Mar 86) pp 484-489

[Article by O. N. Aprelikova, V. M. Mikhaylov, N. V. Tomilin, V. V. Bychko, P. P. Pumpen, V. V. Tsibinogin, O. I. Bratsslavskaya and E. Ya. Gren, Institute of Cytology, USSR Academy of Sciences, Leningrad; Institute of Organic Synthesis, LaSSR Academy of Sciences; Institute of Microbiology, LaSSR Academy of Sciences, Riga]

[Abstract] In order to study some regulatory virus sequences and as a preliminary stage in the production of stable mammal cell clones producing viral protein, the authors produced a series of recombinant plasmids containing the hepatitis B surface antigen HBsAg and various viral promoters, and studied the expression of the gene over short periods of time (several days) after its introduction to various cultivated cells by immunofluorescent or immuno-enzyme methods. The transcription "amplifier" of the hepatitis virus located distally to the HBsAg gene operates in green-monkey kidney cells. The promoter of the bovine leukemia virus requires trans-activating protein factors present in cells infected with bovine leukosis virus. Figure 1, references 21: 3 Russian, 18 Western.

6508/12955

CSO: 1840/842

INFLUENCE OF HYPERBARIC OXYGENATION ON SURVIVAL RATE, MUTAGENESIS AND RE-COMBINOGENESIS OF SINGLE-CELL ORGANISMS

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 21, No 1, Jan-Feb 87 (manuscript received 31 May 85) pp 10-15

[Article by Ye. P. Guskov, Yu. I. Pavlov, M. D. Ter-Avanesyan and V. A. Chistyakov, Rostov University]

[Abstract] Bacterial cells are a convenient model for studying the influence of hyperbaric oxygenation on various metabolic processes. However, the literature has not discussed genetic monitoring of the sensitivity of prokaryotes to HBO. This article studies the influence of various HBO conditions on bacterial cells of different genotypes and yeast cells of different ploidy. HBO was found to cause an increase in mutability in prokaryote strains defective with respect to excision repair and a sharp decrease in the survival rate of mutagenic repair defective strains. HBO is a weak intragenic recombination inductor in yeast, causing no mutations in a haploid strain. References 25: 7 Russian, 18 Western.

6508/12955
CSO: 1840/839

UDC 575.155:577.113:576.535

GENETIC TRANSFORMATION OF SOMATIC CELLS. PART 11. AUTONOMIC REPLICATION OF CLONED BOVINE PAPILLOMA VIRUS DNA IN MOUSE FIBROBLASTS 3T3 NIH AND CHANGE IN GROWTH CHARACTERISTICS OF TRANSFORMED CELLS

Leningrad TSITOLOGIYA in Russian Vol 29, No 3, Mar 87 (manuscript received 20 Mar 86) pp 331-337

[Article by G. A. Dvoryanchikov, T. V. Pospelova and N. V. Tomilin, Institute of Cytology, USSR Academy of Sciences, Leningrad]

[Abstract] In experiments on genetic transformation of somatic mammalian cells, the transforming DNA is inserted into chromosomes and inherited as a chromosomal marker. The only exception to this rule is the bovine papilloma virus, the genome of which can be stably maintained in a cell in an autonomic state, several dozens of copies per cell. The study of the mechanisms of maintenance of the episomal state of the bovine papilloma virus is of significant interest for both theory and practice (biotechnology). This article demonstrates that plasmids containing the bovine papilloma virus nucleotide sequences are present in morphologically transformed clones of line 3T3 NIH after 35-40 cell divisions following transformation of the clone ancestor cell, indicating autonomic replication of the bovine papilloma virus nucleotide sequence in these cells. It is also shown that cells transformed by the bovine papilloma virus can proliferate in a medium

containing a minimal quantity of serum. The plasmid containing the bovine papilloma virus nucleotide sequence, at least in the cells of certain clones, is expressed in the extra chromosomal fraction of DNA long after transformation. Figures 5, references 54: 1 Russian, 53 Western.

6508/12955

CSO: 1840/841

UDC 617.576-001-057-084

PREVENTION OF PRODUCTION LOSSES DUE TO HAND INJURIES IN MACHINE SHOPS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 7, Jul 86
(manuscript received 16 Jul 85) pp 21-24

[Article by I. P. Durmanova, V. S. Fedosova and A. I. Reutov, Sverdlovsk
Scientific Research Institute of Traumatology and Orthopedics, RSFSR
Ministry of Health]

[Abstract] An analysis was conducted on 1586 cases of hand injury in machine shop workers, showing that most of the injuries (34.9%) were due to metal filings. A further 49.3% of the injuries were caused by the machines, and 13.9% were caused by the objects being manufactured. Only 8.4% of those injured became permanently incapacitated, 1% were assigned to easier work, while 90.6% continued to function in their previous capacity. The data also revealed that 82.2% of those incapacitated were injured as a result of organizational factors, indicating that administrative attention to such factors may further diminish hand injury as a factor affecting production losses. References: 9 Russian.

12172/12955
CSO: 1840/1106

UDC 612.112.4-063:612.112.94.017.1-063

STIMULATION OF PHAGOCYTIC FUNCTION BY FACTORS WHICH INHIBIT MIGRATION OF LEUKOCYTES AND MACROPHAGES IN MAN

Moscow BYULLETen EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 8, Aug 86 (manuscript received 3 Jul 85) pp 210-213

[Article by L. V. Gankovskaya, A. Z. Tskhovrebova, N. A. Gvozdeva, L. V. Kovalchuk and A. N. Cheredeyev, Chair and Department of Immunology, Second Moscow Medical Institute imeni N. I. Pirogov]

[Abstract] Simultaneous isolation of macrophage migration inhibition factor [MIF] and leukocyte migration inhibition factor [LIF] from supernatants of lymphocytes cultures, stimulated by phytohemagglutinin (PHA) was performed; the effect of the isolated factors on migration and phagocytic activity of target cells was described and discussed. The experimental fraction with molecular mass of 6-70 kD completely suppressed peripheral blood leukocytes migration but not macrophages migration. The fraction with molecular wt. of 20-30 kD inhibited macrophages of the peritoneal exudate cells of mice. Both MIF-containing and LIF-containing fractions stimulated Fc-receptor-mediated phagocytic activity of neutrophils to the same degree (about 3-fold). The model of phagocytosis of EA particles may be used to assess the activity of different lymphokins for possible use in therapy. The stimulating effect of lymphokins on phagocytosis was attributed to the increase of the number of Fc-receptors, expressed by the phagocyte. Figure 1, references 5: 2 Russian, 3 Western.

2791/12955

CSO: 1840/731

IMMUNOSTIMULATING NATURE OF ASPARTIC ACID

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 8, Aug 86 (manuscript received 30 Oct 85) pp 213-215

[Article by G. A. Belokrylov, Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad]

[Abstract] A comparison of the effect of aspartic acid and that of oligopeptides, differing functionally, (thymopentine, pentagastrin and panangin) on differentiation of T-precursors of bone marrow into T-cells and on the immune response in mice involved experiments on 406 male CBA line mice (wt 14-16 g). Preparations were injected subcutaneously for 10 days in an apyrogenic physiological solution. Control animals received a physiological solution. All of the preparations accelerated the differentiation of T-precursors into T-cell and stimulated the immune response to sheep erythrocytes. Aspartic acid and panangin did not change the immune response to thymus-independent VI-antigen. References 13: 8 Russian, 5 Western.

2791/12955

CSO: 1840/731

UDC 615.276.2.015.4:[612.111/.112+612.41.017.1

EFFECT OF CHORIOGONIN AND AZATHIOPRIN ON HEMOPOIETIC AND LYMPHOID TISSUES IN EXPERIMENT

Moscow GEMATOLOGIYA I TRANSFUZIOLOGIYA in Russian Vol 32, No 1, Jan 87 (manuscript received 17 Jun 85) pp 46-49

[Article by V. V. Nikitina, Dagestan Medical Institute, Makhachkala]

[Abstract] Comparison of the effect of choriogonin and azathioprin on lymphoid and hemopoietic tissue involved two series of experiments. The first series was performed on 21 rats, 8-10 weeks old. The number of nucleus-containing and antibody-forming cells was determined on the 4th day after intraperitoneal injection of $5 \cdot 10^7$ sheep erythrocytes in group 1 rats; the number in group 2 rats was determined after 4-fold interperitoneal injections of choriogonin (500 IU/kg dose) and the number in group 3 rats was determined after 4-fold interperitoneal injections of azathioprin (50 mg/kg). Groups 2 and 3 received a single injection of $5 \cdot 10^7$ sheep erythrocytes after three injections. The 4-fold injection of azathioprin decreased the number of nucleus-containing cells in the spleen considerably but did not affect the number of antibody-forming cells. Injection of choriogonin produced a pronounced immunosuppressive effect of the level on antibody-forming cells but had no effect on the total number of nucleus-containing cells in the spleen. The second series of experiments involved injection of the preparations for 12 days. Injection of azathioprin (50 mg/kg) greatly reduced

the number of leukocytes, lymphocytes and erythrocytes in the peripheral blood but did not affect the spleen rosette-forming cells. Injection of choriogonin (500 IU/kg dose) reduced the lymphocyte count on day 7 and day 14 and the leukocyte count on day 7. Choriogonin suppressed spleen rosette-forming cells but did not affect the erythrocyte count in the peripheral blood nor the total blood count in the spleen and hemopoietic cells. References 10: 5 Russian, 5 Western.

2791/12955
CSO: 1840/687

UDC 591.1

INHIBITION OF ALLOGRAFT REJECTION BY IgE IN MICE

Moscow IZVESTIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKAYA in Russian
No 1, Jan-Feb 87 (manuscript received 20 May 86) pp 142-145

[Article by I. D. Ionov, Scientific-Production Association for Automation of Management of Municipal Economy and Computer Studies, Moscow City Executive Committee]

[Abstract] This is a continuation of studies conducted on the inhibition of allograft rejection by IgE mediating specific anaphylaxis. The experimental model consisted of C57BL/6 mice injected with a small number of splenic cells from CBA mice. The recipient mice formed heat-labile (90 min at 56°C) IgE antibodies that fixed firmly to the skin of the mice and promoted an anaphylactic response against CBA mice splenic cells. The mean rejection time for skin grafts (from CBA mice to C57BL/6 mice) was 8.7 days. However, injection of the recipients with the IgE antibodies from sensitized C57BL/6 mice prolonged the survival of the skin grafts to 12.9 days. Heat treatment of the sera prior to injection into the recipients reduced the rejection time from 12.9 to 9.2 days. The mechanism of action of the heat-labile IgE antibodies was attributed to shielding of the graft by microthrombi formed as a result of anaphylactic reactions at the graft site. Tables 2; references 9: 7 Russian, 2 Western.

12172/12955
CSO: 1840/853

SURVIVAL OF MUSCLE XENOGRAFTS IN ANIMALS

Moscow BYULLETen EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 2, Feb 86
(manuscript received 24 Jan 85) pp 197-199

[Article by A. N. Studitskiy and N. N. Bosova, Laboratory of Evolutionary Histology, Institute of Evolutionary Animal Morphology and Ecology imeni A. N. Severtsov, USSR Academy of Sciences, Moscow]

[Abstract] A method is described for securing long-term xenograft survival involving gastronemius transplants from male Wistar rats to mice and guinea pigs. The fundamental approach consisted of wrapping the muscle in situ with cellophane for 9-12 months prior to transplantation, with retention of blood supply and innervation during the waiting period. Transplantation was performed into the analogous site in the recipient following removal of the recipient's muscle. Following implantation, the tibial nerve was sutured to the donor muscle. The grafts were found to survive for 330 days (the period of observation) following redifferentiation, neovascularization, and extensive reinnervation in the recipient site. The long-term survival of the xenograft was attributed to loss of original antigenic tissue specificity as a result of differentiation and the acquisition of chimeric characteristics. Functional status of the transplant was demonstrated by contractility following stimulation of the nerve with induction current. Figures 3, references 12: 7 Russian, 5 Western.

12172/12955

CSO: 1840/1118

UDC 617.755.1-073

INSTRUMENT FOR DETERMINATION OF CRITICAL FREQUENCY OF FLICKER FUSION

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 1, 1987 (manuscript received 30 Jun 86) pp 15-16

[Article by O. Yu. Netudykhatka and V. G. Kravets, Odessa Branch, Scientific Research Institute of Water Transportation Hygiene]

[Abstract] A cursory description is provided of an instrument designed for easy determination of the critical frequency of flicker fusion, a measure of visual fatigue. The instrument [Author's Certificate No 1225526], allows for the determination of the critical frequency without an adaptation phase, leading to convenience in use in the occupational setting. Rotation of the perforated disk proceeds with a frequency of 4-45 Hz, with an angle of rotation of ca. 2.5° . With this instrument 10 workers were examined at a time over a 10-15 min period, rather than the usual 50-150 min. The time saving underscores the applicability of this approach to mass screening for visual fatigue. Figures 1.

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CSO: 1840/851

UDC 615.849.19.03:617-089:617-089:615.849.19

CURRENT PROSPECTS FOR GAS LASERS IN SURGERY

Moscow MEDITSINSKAYA TEKHNIKA in Russian No 4, Jul-Aug 86
(manuscript received 21 Jun 85) pp 3-14

[Article by V. S. Aleynikov, V. P. Belyayev, N. D. Devyatkov and V. I. Ma Masychev]

[Abstract] A review is presented of the current state of laser use in medicine, with emphasis on laser surgery. Recent advances in laser science, a field particularly well developed in the USSR, have provided surgeons with a wide range of wavelengths to choose from, in combination with high spatial coherence, various power outputs, and a high degree of reliability. The recent availability of much improved continuous CO₂ lasers and pulse-mode CO₂ and copper-vapor lasers has opened up new vistas in surgery on soft tissues well supplied with blood or with a low water content, such as teeth, bone, and fatty tissues. New advances in fiber optics have been applied to the generation of more practical endoscopic lasers, a field that is yet in its infancy. Figures 15, tables 1.

12172/12955
CSO: 1840/1099

UDC 616.366.7-085.849.19

GALLSTONE DESTRUCTION WITH ENDOSCOPIC YAG-Nd LASER PULSES

Moscow MEDITSINSKAYA TEKHNIKA in Russian No 4, Jul-Aug 86 (manuscript received 30 Oct 85) pp 15-18

[Article by C. V. Yurchenko, V. Kh. Bagdasarov, N. N. Denisov, A. A. Ketkovich, A. A. Manenkov, V. V. Meshkov, V. I. Ryabykh and A. N. Starkovskiy, No 1 Central Clinical Hospital No 1 MPS (Ministry of Communications); Institute of General Physics, USSR Academy of Sciences, Moscow]

[Abstract] In vitro studies were conducted on the effectiveness of an endoscopic YAG-Nd laser with a quartz waveguide in the destruction of

gallstones differing in chemical composition. Operating with 12 J/pulse mode at a frequency of 1-6 Hz resulted in the breakdown of the stones after 10-15 pulses. However, it became evident that cholesterol gallstones were most refractory to destruction in this manner. Studies with gallbladders obtained as a result of surgery and with cadaveric materials demonstrated that the laser parameters employed in the study did not lead to tissue damage, suggesting that this approach may have clinical utility. References 5: 2 Russian, 3 Western.

12172/12955
CSO: 1840/1099

UDC 615.472.03:615.849.19+615.849.19]:008

CURRENT STATUS AND TRENDS IN MEDICAL LASERS

Moscow MEDITSINSKAYA TEKHNICA in Russian No 4, Jul-Aug 86 (manuscript received 21 Jun 85) pp 40-45

[Article by I. M. Arefyev, All-Union Scientific Research and Testing Institute of Medical Technology, Moscow]

[Abstract] A summary review is presented of the current state and trends in the development of medical lasers in the USSR. Two major directions in this field are currently distinguishable, one emphasizing the development of laser instrumentation for laboratory diagnosis, and the other stressing laser applications in surgery and physical therapy. Overlap in the two basic approaches is seen in the development of laser apparatus for environmental monitoring, as well as in the construction of new diagnostic -- laser-based -- technology for physical diagnosis and patient monitoring. The laser technology has received great impetus for its development with the implementation of the national health screening program in the USSR that, of necessity, makes mandatory the development of novel technology for rapid patient processing.

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CSO: 1840/1099

UDC 621.378.9:61

LASER ENDOCOAGULATION APPARATUS

Moscow MEDITSINSKAYA TEKHNICA in Russian No 4, Jul-Aug 86 (manuscript received 5 Jun 85) pp 57-58

[Article by A. A. Zaletskiy, M. I. Katayev and A. I. Martynov]

[Abstract] Cursory description is provided of an argon laser unit suitable for endoscopic photocoagulation. The system has been used successfully

in the treatment of acute intragastric hemorrhages; the eyes of the surgeon are protected by an orange filter. Although currently designed for gastroenterological use, the use of the apparatus may be extended to other medical specialties through the use of appropriate fiber optic guides. Figures 1, references: 1 Russian.

12172/12955
CSO: 1840/1099

UDC 616.1-089:615.849.19

USE OF LASERS IN CARDIOVASCULAR DISEASES: BEGINNING OF LONG JOURNEY
(SURVEY OF LITERATURE)

Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 58, No 5, May 86
(manuscript received 4 Feb 86) pp 139-146

[Article by A. A. Belyayev, S. E. Ragimov and L. S. Afanasyeva, All-Union Cardiology Science Center, (director Ye. Yi Chazov, academician), USSR Academy of Medical Sciences, Moscow]

[Abstract] A survey of the literature, conducted in order to determine the extent of use of lasers in cardiology, heart surgery and angiosurgery, was described and discussed. Topics discussed briefly include: types of lasers used in this area of medicine, laser angioplasty, myocardial fenestration (intraventricular revascularization), laser myoelectomy, valve plastic surgery, septostomy and other interventions, the laser and conducting pathways of the heart, the laser and vessel microsurgery and therapeutic use of low-energy lasers. The use of lasers in diagnosis and treatment of heart disease shows great promise but there is need for improvement of laser equipment, of data recording and processing systems and of assurance of the safety of physicians and patients. References 110: 13 Russian, 97 Western.

2791/12955
CSO: 1840/751

ARGON LASER TREATMENT OF OPEN-ANGLE GLAUCOMA

Odessa OPTALMOLOGICHESKIY ZHURNAL in Russian No 2, 1987 (manuscript received 23 Jul 85) pp 98-101

[Article by A. P. Kollegov, physician, F. A. Romashenkov, candidate of medical sciences, N. S. Yartseva, docent and G. A. Shilkin, doctor of medical sciences, Moscow Scientific Research Institute of Microsurgery of the Eye, RSFSR Ministry of Health]

[Abstract] A study is presented of the effectiveness of argon laser trabeculoplasty (LTP) in treatment of open-angle glaucoma in both the short and the long term. The following parameters of laser radiation were used: Power 800-1200 mW, spot diameter 50 μ m, exposure time 0.1 s. Formation of a gaseous bubble or serous coagulate indicated successful laser action. 30-40 Applications were used. Results of treatment were evaluated on the basis of hydrodynamics, visual acuity and field. The studies showed that argon-laser trabeculoplasty is an effective method of treatment of patients in stage I and II of the disease, allowing normalization of ophthalmotonus in the first few months after treatment in 80% of cases. In 54% of the treated eyes after 1-3 years, the intraocular pressure returned to the initial figures. Retreatment in a new area allowed normalization of intraocular pressure in 77% of these cases over 6-16 months of observation. In patients with stage III and IV of open-angle glaucoma, accompanied by sclerosis of the corneoscleral trabecula, there was no hypotensive effect after laser treatment. References 14: 10 Russian, 4 Western.

6508/12955
CSO: 1840/852

FIRST ATTEMPT AT USING ARGON LASER IN TREATMENT OF PIGMENTED SKIN LESIONS

Moscow KHIRURGIYA in Russian No 4, Apr 87 (manuscript received 12 Sep 86) pp 102-104

[Article by O. K. Skobelkin, professor, T. M. Titova, doctor of medical sciences, and S. Ye. Bogdanov, Moscow]

[Abstract] Cursory information is provided on the first attempt at argon laser for the treatment of a variety of pigmented skin lesions (hemangiomas, pigmented nevi, teleangiectasia, tattoos, aging keratomas). The argon laser was selected because its emission spectrum (480-520 nm) overlaps the absorption band of melanin and hemoglobin. Treatment of 21 patients (1-4 W, 128-512 W/cm²) showed that, depending on the extent of the lesion, up to 6 sessions of treatment were required at 2-3 month intervals between treatment sessions for depigmentation. The therapy was successful in 20 of the

patients, and felt to represent a treatment modality that deserves further development for this class of skin lesions. References 11: 2 Russian, 9 Western.

12172/12955

CSO: 1840/809

UDC 616.3-006-007.272-089.819.2:615.849.19

ENDOSCOPIC LASER RECANALIZATION OF TUMOR-OCCLUDED GASTROINTESTINAL TRACT

Moscow KHIRURGIYA in Russian No 4, Apr 87 (manuscript received 2 Dec 86)
pp 118-121

[Article by V. I. Pronin, professor, M. L. Stakhanov and V. F. Yevmenov, candidates of medical sciences, V. M. Meshkov, Ye. Ye. Dolganov, V. V. Grigoryants, professor and V. A. Korolev, Chair of Oncology, Moscow Medical Stomatological Institute imeni N. A. Semashko; Central Clinical Hospital No 4 imeni N. A. Semashko, USSR MPS (Ministry of Communication)]

[Abstract] Clinical trials were conducted with Nd:YAG laser endoscopy in the management of gastrointestinal tract obliterations due to tumors in 63 patients. The laser was used in a continuous-emission mode approaching 125 W at a wavelength of 1.06 μm , yielding 3.9-4.9 mm channels for a length of 1.5-2 cm per treatment session. A relatively short-term follow-up (2 months to 1.5 years) showed good retention of patency. Under the circumstances of the trial, best results were obtained with 40-70 2-4 sec pulses at 50 ± 5 W (256-400 W/cm²). In most cases and locations 3-6 treatment sessions were required for successful treatment, with the sessions scheduled at 2-5 day intervals. The method was felt to represent a safe and effective treatment approach to tumor-occlusions in the gastrointestinal tract. References 21: 1 Russian, 20 Western.

12172/12955

CSO: 1840/809

UDC 616.71-089.85:615.849.19

CO₂ LASER BONE RESECTION

Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 2, Feb 87 (manuscript received 24 Jul 85) pp 47-48

[Article by S. Ye. Kholodnov, N. S. Fomin, A. N. Ozerskiy and N. V. Artamonov, No 62 Moscow Oncological Hospital]

[Abstract] A brief review is provided on experience gained in rib and femur resection with CO laser. The consensus of the results was that CO₂ lasers operating in the pulse mode are to be recommended for both types of bone,

yielding a more limited area of damage and favoring a more rapid resection than lasers in the continuous mode. These observations confirm the results of other workers on the use of CO₂ lasers in bone surgery. References 6: 3 Russian, 3 Western.

12172/12955
CSO: 1840/806

UDC 576.24:581.167

MUTAGENIC EFFECTS OF NITROGEN LASER ON PLANTS

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 2, Mar-Apr 87
(manuscript received 5 Jul 85) pp 57-59

[Article by Kh. A. Atakhodzhaeva and P. K. Soldatov, Samarkand State University imeni A. Navoi]

[Abstract] Trials were conducted on cotton and onion to assess the effectiveness of nitrogen laser to induce mutations for breeding purposes. The studies were undertaken with Samarkand-3 cotton and Karatelskiy onions, using a nitrogen laser (337 nm) operating at 0.4 mJ power output, with 2-20 sec exposures and 10 pulse/sec. Enumeration and evaluation of the chromosomal aberrations in the rootlets showed that the nitrogen laser was an excellent inducer of radiation-induced mutations, and can be recommended for extensive use in crop breeding. The frequency of induced chromosomal aberrations in the cotton samples exceeded, 2- to 3-fold, the incidence of spontaneous baseline mutations. The excessive mutations obtained in case of the onion studies were 1.5- to 2-fold greater than the control value. The abnormalities represented a wide spectrum of derangements, with single and double fragments encountered most frequently, and single and double bridges less frequently. Figures 1, references: 8 Russian.

12172/12955
CSO: 1840/859

BRIEFS

NEW LASER BIOSTIMULATORS INSTALLED--Laser biostimulators manufactured by the Kaluga radio tube plant (248000 Kaluga, Grabtsev chaussee) have been added to the technical arsenal of flower growers and gardeners. The "Urozhay" laser was designed for treating seeds and roots of seedlings prior to sowing. 100 Grams of the seeds are biologically stimulated for 30 seconds to five minutes, which reduces the period of vegetation as well as the time required for the plants to sprout and the fruits to mature. This results in an approximately 25 percent increase in the harvest. [Text] [Moscow NTR: PROBLEMY I RESHENIYA in Russian No 9, 5-18 May 87 p 2] 13287/12955

CSO: 1840/888

UDC 591.524.1

ADAPTIVE REDUCTION IN BLOOD FLOW IN MUSCLES OF DIVING MAMMALS

Leningrad ZHURNAL EVOLYUTIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 23,
No 1, Jan-Feb 87 (manuscript received 24 Jan 85) pp 110-114

[Article by T. V. Neshumova and V. A. Cherepanova, Institute of Physiology,
Siberian Department, USSR Academy of Medical Sciences, Novosibirsk]

[Abstract] Xe-133 and Na-22 clearance studies were conducted on the skeletal musculature of the Baikal seal (*Phoca sibirica*), muskrat (*Ondatra zibethica*), and the aquatic vole (*Arvicola terrestris*) during diving to assess circulatory changes as an adaptive mechanism. Diving resulted in virtually complete cessation of blood flow in the skeletal muscles of the seal, with the exception of the neck musculature. A 7-fold reduction in the blood flow of the skeletal muscles (including neck muscles) was seen in the muskrat, and a mere 20% reduction was obtained in the vole. These differences in the vasoconstrictive patterns reflected different degrees of adaptation to prolonged apnea and variation in oxygen supplying mechanisms. Concomitantly, a 50% vasoconstriction was obtained in the Baikal seal with 10^{-7} g/ml of norepinephrine, whereas the equivalent degrees of vasoconstriction in the muskrat and the vole required norepinephrine concentrations of 10^{-6} and 10^{-5} g/ml, respectively. In the recovery phase of blood flow in the skeletal muscles after diving, the blood vessels were entirely refractory to epinephrine in the seal, but remained responsive in the muskrat and the vole. These differences reflected the greater adaptation of the seal to underwater existence for prolonged time periods, with the changes designed to minimize systemic distribution of metabolites during diving and ensure maximum oxygen supply to the brain. Figures 2, references 4: 3 Russian, 1 Western.

12172/12955

CSO: 1840/813

BRIEFS

PRESERVATION OF BLOOD--Ukrainian specialists have proposed an effective method of preserving blood under protracted freezing. Using conventional methods, a large proportion of the donor's blood cells is destroyed in the process of freezing and defreezing. If the cooling is slowed down, the cell has time to start up the natural mechanism of adaptation to extreme conditions, which implies dehydration: the cell itself eliminates excess water and is frozen in a compact form. This enables it to fully preserve its viability. New cryogenic facilities are employed in the republic at a number of blood transfusion stations. [Text] [Moscow SOVIET UNION in English No 4, Apr 1987 p 27] 12955

CSO: 1840/753E

BRIEFS

LASER SCALPEL--The laser is becoming a more and more certain part of our everyday life. It seems that quite recently many stomatological polyclinics of the country began using surgical instruments which operate using an energy beam. And now a new laser apparatus has appeared in the arsenal of medical workers' instruments for treating eye diseases. It has been installed in the eye department of the "Skoraya pomoshch'" Hospital in Kirovakan. The instrument, which uses monopulse and helium-neutron radiation, will become a true assistant to doctors in complicated eye operations. Use of the instrument substantially reduces the duration of the treatment process, and in comparison to the other methods the recovery of vision is twice as good. Today this apparatus is being used in the eye department of Hospital No 8 in Yerevan, and in the Republic Ophthalmological Center. This year still another facility will go into construction in the Central Rayon Hospital in Kamo. [By G. Antonyan] [Text] [Yerevan KOMMUNIST in Russian 24 Jan 87 p 4] 12255

CSO: 1840/515

COMBATTING, ACUTE INFECTIONS

Moscow SOVIET UNION in English No 4, Apr 87, p 27

[Text] Pyo-inflammatory processes such as peritonitis, sepsis and others (known as endotoxicoes) progress at times so fast that the patient's life is endangered literally in a few hours. In some cases conventional treatment--large doses of antibiotics, blood or plasma transfusion--is ineffective. At the Moscow Rayon Clinical Research Institute, specialists guided by Professors A. Sazonov and L. Ender developed a comprehensive method for the treatment of these dangerous diseases.

"Serious endotoxicoes affect vital organs, particularly the brain," says Lev Ender. "We therefore resorted to comprehensive treatment: removal of suppurative foci followed by emergency cleaning of the patient's blood from toxins and cellular decay products. The latter is done by means of a fractionator. The specially treated light plasma which has become immune to the activators of a particular pathological process is separated from the patient's blood removed for cleaning. Before the blood is returned to the organism it undergoes another "purification" procedure--ultraviolet irradiation, which is a kind of sterilization of the blood.

"It is minutes that decide the outcome of these cases, and we, therefore, follow up the effectiveness of the treatment by means of encephalographic monitoring. The new method has already helped save dozens of lives."

/12955

CSO: 1840/753E

UDC 616.71-003.93-02:[615.849.11+615.849.19-076.4

ELECTRON MICROSCOPIC AND MORPHOLOGICAL STUDY OF BONE REGENERATION AFTER
MAGNETIC-LASER STIMULATION

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,
No 8, Aug 86 (manuscript received 16 Oct 85) pp 247-250

[Article by D. D. Attakurov, Chair of Histology and Embryology (head-
Professor Ye. Ya. Pankov, Kharkov Medical Institute)]

[Abstract] An electromicroscopic and morphometric study of the dynamics of cellular and non-cellular components of bone regenerate under the effect of a permanent magnetic field, low intensity laser irradiation and combinations of these involved experiments on 40 male Wistar rats under hexenal narcosis. Holes were made in the tibia. The magnetic effect was produced by magnetic induction of 31-33 mTl in a 15-minute exposure. Neon-helium laser exposure was produced by a CG52 laser at wavelength $\lambda = 632.8$ nm, power 8 mW, exposure 15 minutes. The combined action lasted 30 minutes. Single effect of the magnetic field and the laser exposure caused significant decrease of edema and increase of the volumetric percent of the cellular component due predominantly to fibroblasts and also a significant decrease of the relative volume of collagen fibers. After the magnet- and -laser exposure, the hole was filled with polyblastic cells. The most pronounced effect on differentiation of the cellular component of the bone regenerate came from the combination of magnetic and laser exposure which caused filling of the bone defect in a shorter period. Figures 3, references 7: 3 Russian; 4 Western.

2791/12955
CSO: 1840/731

UDC 582.281.144:575.24

GENETIC STUDY OF ASPOROGENIC MUTANT OF PHYTOPHTHORA INFESTANS (MONT.) D BY.

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 21, No 1, Jan-Feb 87
(manuscript received 27 Nov 85) pp 52-55

[Article by A. V. Dolgova and Yu. T. Dyakov, Department of Lower Plants,
Moscow State University, imeni M. V. Lomonosov]

[Abstract] Among mutants of *Ph. infestans* resistant to antibiotics, one isolate, resistant to acriflavine, was found to be slowly growing and asporogenic. It did not form conidia when grown on an oat medium, in contrast to other mutants from the same group. Monozoosporic analysis of the isolate indicated that the factor determining the asporogenic property of the mutant has a cytoplasmic nature, since in terms of nuclear characteristics (resistance to antibiotics) splitting did occur but was not accompanied by a split in terms of the characteristic of asporogenicity. Direct genetic experiments thus agree with previous analysis of a variety of morphologic characteristics. The characteristic of asporogenicity was observed to vary in extent, manifesting various intermediate degrees of asporogenicity in different strains, probably as a result of dilution of the cytoplasmic factor in the process of plasmogamy. Figures 2, references 5: 3 Russian, 2 Western.

6508/12955

CSO: 1840/838

UDC 582.28:632.934

FUNGICIDAL EFFECT OF HALOGEN-CONTAINING OLIGOMERS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 21, No 1, Jan-Feb 87
(manuscript received 22 Nov 85) pp 68-72

[Article by L. A. Pivazyan and R. A. Petrosyan, Institute of Microbiology,
Armenian SSR Academy of Sciences, Yerevan]

[Abstract] Organic fungicides can be used to modify polymer materials, reducing the number of components in composite materials and minimizing

physical microheterogeneity, which facilitates biological overgrowth and damage. This article reports the fungicidal effect of low-molecular-weight compounds, bromine-chlorine-and iodine-containing oligomers used as plasticizers and antipyrenes for polymers. The fungicidal properties of the compounds at 0.5-5.0% concentration were tested using mixed cultures of fungi. The studies showed that, of the halogen-containing oligomers, the most effective were iodine-containing oligomers, the fungicidal effect of which appeared at lower concentrations and earlier stages of incubation of cultures. The fungicidal activity of the oligomers also depended on accessibility of the substrate as the only source of organic carbon. Figures 2, references 15: 14 Russian, 1 Western.

6508/12955
CSO: 1840/838

UDC 632.4:582.281.144

METABOLITES OF PHYTOPHTHORA FUNGI ACTING ON HOST PLANT CELLS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 21, No 1, Jan-Feb 87
(manuscript received 16 Apr 86) pp 91-100

[Article by M. A. Protsenko, Institute of Biochemistry, imeni A. N. Bakh, USSR Academy of Sciences, Moscow]

[Abstract] This review of the Soviet and Western literature discusses metabolites of plant-attacking phytophthora fungi. The resistance of plants is manifested as a limitation of penetration of the fungus into their tissues, less intensive development of the fungus and supersensitivity and death of damaged cells to prevent further spread of the fungus. A number of metabolites of the fungi have been identified which play an important though often unclear role in interrelationships with host plants. Very little data have been obtained relating the changes observed in host-plant cells to the effects of any specific metabolite. Toxins, depolymerase enzymes, elicitors, suppressors and general antigens are discussed. The data presented indicate complex action of the fungi on host plant tissues, with the various factors manifested to varying degrees in different representatives of the genus. The species and varieties of host plant also differ in sensitivity to the factors produced by the fungus. References 116: 38 Russian, 78 Western.

6508/12955
CSO: 1840/838

ULTRASTRUCTURAL ASPECTS OF RICKETTSIA SIBIRICA-HOST INTERACTION

Bratislava ACTA VIROLOGICA in Russian Vol 30, No 6, Nov 86 (manuscript received 17 Aug 85; in final form 18 Feb 86) pp 494-498

[Article by V. L. Popov, R. G. Dyusaliyeva, N. S. Smirnova, I. V. Tarasevich and N. N. Rybkina, Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] Ultrastructural studies on L-929 monolayers infected with *Rickettsia sibirica* showed accumulation of the pathogen in large, 1.3-2.8 μm , cytoplasmic spaces 6 h after infection. The individual bacteria were in the form of 0.3 x 1.0 μm rods surrounded by 200 nm-wide halo representing the capsular layer. A 12 nm thick microcapsule was located immediately adjacent to the surface of the cell wall, containing differentiated subunit structures with a periodicity of ca. 12 nm. The 14 nm cell wall was bilamellar in nature, with occasional separation of the two components into 2 electron-dense layers. The internal layer was identified as the peptidoglycan component. Finally, a 5 nm periplasmatic space separated the wall from the 7 nm-thick cytoplasmic membrane. In their general features, the cells of *R. sibirica* were similar to those of other rickettsiae of the spotted fever group, possessing a somewhat thicker capsular cover. Figures 3, references 21: 4 Russian, 17 Western.

12172/12955
CSO: 1840/834

UDC 576.8

ISOLATION OF ACTINOMYCETES FROM CENTRAL ANTARCTIC ICE SHEET

Moscow IZVESTIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKAYA in Russian No 1, Jan-Feb 87 (manuscript received 18 Nov 85) pp 35-41

[Article by S. S. Abyzov, S. N. Filippova and V. D. Kuznetsov, Institute of Microbiology, USSR Academy of Sciences, Moscow]

[Abstract] Ice samples were obtained at a depth of 320 m from the Antarctic ice sheet by Soviet No 20, 21, 22 and 25 expeditions, for an analysis of actinomycete presence. Cultural studies on 202 core samples, yielding 1142 individual microbiological samples resulted in the identification of *Nocardia* and *Nocardiosis* in only 87 samples, or 7% of the total samples. The age of the ice from which the samples were collected ranged from 150 to 9400 years. The *Nocardia* and *Nocardia*-like microorganisms that were isolated corresponded to the isolates regularly made on Antarctic soil, snow and air samples. References 49: 20 Russian, 29 Western.

12172/12955
CSO: 1840/853

REPRODUCTION OF TICK-BORNE ENCEPHALITIS VIRUS (TBEV) IN HAEMAPHYSALIS INERMIS
TICKS AND THEIR TISSUE EXPLANTS

Bratislava ACTA VIROLOGICA in Russian Vol 30, No 5, Sep 86 (manuscript received 7 Jan 86) pp 396-401

[Article by J. Nosek*, S. P. Chunikhin, (dec.), M. Gresikova, M. B. Korolev,* O. Kozuch, L. F. Stefutkina* and T. I. Ivannikova, Institute of Virology, Slovak Academy of Sciences, Bratislava; Institute of Poliomyelitis and Viral Encephalitides,* USSR Academy of Medical Sciences, Moscow]

[Abstract] A combination of virological, ultrastructural, and immunomorphological studies were conducted on the reproductive process of TBEV in Haemaphysalis inermis tissues and their explants. TBEV was found to reproduce in various tissues in various stages of development, with tissues of ectodermal origin supporting the most active reproduction. In addition, electron microscopy demonstrated the presence of viral particles in the ecliptic phase of persistent infection, at a time when virological methods were ineffective in demonstrating viral presence. In the in vivo system, the initiation of the ecliptic phase coincided with cuticle formation of the next insect developmental stage. In the in vitro system (explants) the hormonal control mechanisms for its termination were lacking, resulting in a persistent ecliptic phase. Figures 4, references 11: 7 Russian, 4 Western.

12172/12955
CSO: 1840/833

ULTRATHIN FROZEN TISSUE SECTION STUDY OF RICKETTSIA PROWAZEKII ULTRA-
STRUCTURE IN CELL CULTURE

Bratislava ACTA VIROLOGICA in Russian Vol 30, No 5, Sep 86 (manuscript received 11 Jul 85) pp 436-439

[Article by N. S. Smirnova, V. L. Popov and I. N. Kokorin, Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] Ultrathin frozen tissue sections were employed to study the ultrastructural characteristics of Rickettsia prowazekii grown in L-929 cells 4 days after infection. The rickettsiae were located in the extravacuolar cytoplasmic space, forming microcolonies. The individual rickettsiae were 400 x 700 nm in size, possessing a 5 nm thick cell wall, a 14 nm wide periplasmic space, and a 6 nm thick cytoplasmic membrane. Most of the rickettsiae did not show a halo, with the individual bodies tightly packed within the microcolonies. Occasional rickettsiae at the boundaries of the microcolonies were in tight contact with the mitochondria of host cells. Figures 3, references 11: 2 Russian, 9 Western.

12172/12955
CSO: 1840/833

UDC 616-001.17-08+615.454.1:547.587.11

SALICYLIC ACID OINTMENT NECRECTOMY IN DEEP BURNS

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 86 (manuscript received 13 Dec 85) pp 12-13

[Article by V. K. Sologub, Yu. Ye. Babskaya, K. S. Sarbanova and P. M. Perekhrestenko, All-Union Burns Center, Institute of Surgery imeni A. V. Vishnevskiy, USSR Academy of Medical Sciences]

[Abstract] Therapeutic trials were conducted on 50 patients with deep burns to assess the effectiveness of a 40% salicylic acid ointment in necrectomy. Application of 200 g of the ointment to cover 10% body surface led to scab removal in 48 h from the underlying tissues with the formation of granulation tissue. After 3-5 days the granulation tissue was prepared for dermatoplasty. Maximum salicylate levels in the blood were detected 18 h after a second application of the ointment when needed (125 mg/liter), falling to twice control levels in 72 h (78 mg/liter), in patients vs. 42 mg/liter baseline). The blood levels of salicylate were below toxic levels. Elevated serum urocaninase activities in 2 patients were not accompanied by hepatic damage. Salicylic acid ointment was felt to be a suitable chemical agent for necrectomy in patients with deep burns in the concentration used, without undue risk of complications. References: 2 Russian.

12172/12955

CSO: 1840/1126

EFFECTS OF THERMAL FACTORS ON BONE RECOVERY

Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYA in Russian No 3,
Mar 87 (manuscript received 20 Aug 86) pp 28-30

[Article by V. Kh. Sabitov, Ye. S. Zelenov, G. A. Izmaylov and S. M. Gorbunov,
Kazan Medical Institute imeni S. V. Kurashov]

[Abstract] An analysis was conducted on the effects of thermal factors in bone healing and recovery, using a rabbit model in which the femur was sectioned with accompanying exposure to temperatures of 37-180°C for 5-240 sec. Long-term follow-ups (up to 60 days postoperatively) demonstrated that limiting the temperature effects to 40-80°C to 5 sec with at least 3-5 sec intervals had a positive effect on bone repair processes. Temperature conditions of 80°C or higher for 10 or more seconds had an adverse effect on bone repair, leading to impaired mechanical structures. Application of these observations to 60 patients subjected to bone resection and boring demonstrated that constraints designed to diminish undue temperature elevations had a similar favorable effect on the outcome. The number of various complications were reduced by 20% in the group of patients in whom such precautions had been taken. References: 3 Russian.

12172/12955
CSO: 1840/807

UDC 616-001.3-06-002.3-089:616.13/.14-089:615.398

ENHANCEMENT OF DETOXICATION EFFECTIVENESS OF HEMOSORPTION BY INFUSION
THERAPY IN PATIENTS WITH MECHANICAL TRAUMA AND PURULENT/SEPTIC COMPLICATIONS

Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 138, No 1,
Jan 87 (manuscript received 12 Jul 85) pp 87-90

[Article by I. I. Deryabin, A. A. Trusov, A. S. Rozhkov, B. V. Shashkov
and I. S. Gard, Chair of Military Field Surgery, Military Medical Academy
imeni S. M. Kirov, Leningrad]

[Abstract] The clinical efficacy of a combination of infusion therapy and hemosorption was evaluated in the case of 13 patients that had sustained mechanical trauma, with further complications represented by purulent/septic conditions. The outline of the therapy indicated an initial 0-1.5 h course of hemodilution, followed by 1.5-2 h course of antibiotic therapy, forced diuresis for 2-2.5 h, and microvasoplegia for 2.5-3 h. The final stage consisted of 3-5 h hemosorption using SKN activated charcoal, and a final phase (5-24 h) of infusion/transfusion therapy. The clinical monitoring demonstrated that this approach was effective in reducing blood levels of

proteolytic activity to control levels. The outcome was favorable in the case of 8 (61.5%) of the patients, further supporting this therapeutic regimen developed by P. K. Dyachenko [Vestnik Khirurgii, No 11, pp 19-26, 1982]. References: 8 Russian.

12172/12955
CSO: 1840/810

UDC 616-001-036.1-072.1

RHEOGRAPHIC MONITORING OF TRAUMA CASES

Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 138, No 1, Jan 87 (manuscript received 12 Nov 85) pp 106-107

[Article by E. V. Pashkovskiy, O. S. Nasonkin and N. D. Falina, Military Medical Academy imeni S. M. Kirov, Leningrad]

[Abstract] Rheoencephalographic and rheovasographic indices were studied in conjunction with the clinical course of 80 patients with severe trauma. In comparison with data derived for 40 healthy control subjects the rheovasographic index decreased by ca. 25% during the first 24 h, and the rheoencephalographic index increased by 21%. By 75 h, the rheovasographic index increased to virtually control levels and remained at that level at the time of discharge (after 21 days), while the rheoencephalographic index remained elevated for that period of time. Twenty of the patients died due to the severity of their injuries. In the latter group of patients there was a marked reduction in peripheral blood flow and some diminution of cerebral circulation due to enhanced cerebrovascular tone. These observations demonstrated that these rheographic indices may be used to monitor the clinical course of trauma patients and provide prognostic information as to outcome. Figures 1, references 6: 5 Russian, 1 Western.

12172/12955
1840/810

UDC 616.717/718-001.5-089.2

EXPERIMENTAL STUDIES ON SURGICAL MANAGEMENT OF OPEN FEMORAL FRACTURES

Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEXIROVANIYE in Russian No 2, Feb 87 (manuscript received 17 Jan 86) pp 28-30

[Article by V. V. Chaplinskiy, G. G. Chekhovich, V. S. Petrus and Ya. Ye. Yatskevich, Chairs of Traumatology and Military Field Surgery and of Microbiology, Lvov Medical Institute]

[Abstract] Several modalities of surgical treatment for open femoral fractures were evaluated on outbred rabbits to select an optimum approach for

possible clinical application. The fractures were infected with intraosseous administration of *S. aureus*. The resultant data showed that best clinical results were obtained with a combination of external and internal (intraosseous) lavage with a penicillin solution (3 U/200 ml 0.25% novocain) enhanced by ultrasonic cavitation. The use of fixation in conjunction with ultrasonically-mediated lavage was seen to provide an additional advantage in preventing septic shock. References 12: 11 Russian, 1 Western.

12172/12955
CSO: 1840/806

UDC 613.68.007.1:313.13

MORBIDITY PATTERNS OF OFFICER STAFF OF AZOV SEA STEAMBOAT NAVIGATION

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 11, Nov 86 (manuscript received 17 Sep 85) pp 33-35

[Article by S. V. Naletov, P. Ya. Kravtsov, docent, S. N. Shcherbakov, docent and V. N. Vecherskiy, Donetsk Medical Institute imeni M. Gorky; Zhdanov Central Basin Water Transportation Hospital].

[Abstract] An analysis was conducted on the morbidity data collected over 1980-1984 for 60% of the commanding staff of Azov Sea steamboat navigators. The data revealed that in 97.8% of the cases, treatment was administered without resorting to sick leave. The disease pattern showed that respiratory diseases predominated in the morbidity pattern, largely due to viral infections, followed by bronchitis and pneumonia. Other serious clinical problems were represented by hypertension, coronary insufficiency, peptic ulcers, varicose veins, and obliterating endarteritis. Trauma was usually encountered in officers dealing with the mechanical aspects of boat management, while hypotension and neurasthenia predominated among radio operators. In addition to direct measures that should be employed to mitigate the occupational risk factors predisposing to the above diseases, emphasis should also be accorded to counseling to alleviate emotional stress.

12172/12955
CSO: 1840/835

UDC 616.633.478.5-06:616.899-055.5/.7]-07:616-018.2-008.939.533.2

LYMPHOCYTES OF HOMOCYSTINURIC PATIENTS AS MODEL SYSTEM FOR STUDYING REPAIR MECHANISMS IN HUMAN CELLS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 2, Feb 86 (manuscript received 15 Feb 85) pp 195-197

[Article by G. D. Zasukhina, Yu. I. Barashnev, G. N. Lvova, T. A. Sinelshchikova, N. N. Shoniya and A. N. Semyachkina, Laboratory of Viral Genetics, Institute of General Genetics imeni N. I. Vavilov, USSR Academy of Sciences; Department of Genetics of Hereditary Diseases, Institute of Pediatrics and Pediatric Surgery, USSR Ministry of Health, Moscow]

[Abstract] DNA repair mechanisms were studied in the case of lymphocytes obtained from 6 homocystinuric patients for comparison with data obtained for normal human lymphocytes, using techniques relying on vaccinia virus reactivation and alkaline elution of DNA from membrane filters. Both methods yielded identical results, pointing to the fact that in the cells obtained from the patients repair mechanisms were markedly attenuated. The level of gamma-radiation and 4-nitroquinoline-1-oxide induced mutations in the vaccinia virus was two-fold higher in homocystinuric lymphocytes than in the control cells. These observations demonstrated that this approach may be used as an additional diagnostic technique for homocystinuria, as well as the fact that lymphocytes derived from such patients may serve as a convenient model system for studying human DNA repair mechanisms. Figures 2, references 5: 3 Russian, 2 Western.

12172/12955
CSO: 1840/1118

ALTERATION OF GENE DESIGN

Moscow ZNANIYE - SILA in Russian No 3, Mar 87, p 7

[No author indicated]

[Text] This great and noble goal [title] has been set forth by genetists. The path to its achievement is twisted and unexplored, full of painstaking experimentation and laborious analysis of enormous amounts of controversial data. However, a hope seems to come from the unpretentious and complaisant, rapidly-reproducing fruit fly--*Drosophila*. An associate scientist of the Institute of Molecular Biology and Genetics of the Academy of Science of UkSSR, T. Shandala, has designed an experiment in which the fruit fly plays the major role. It has been established that if certain foreign substances are injected into the fruit fly, its offspring will, faithfully, undergo mutation. The foreign substance may consist of various materials, including, for example, a solution of deoxyribonucleic acid (DNA). The mechanisms by which the mutation takes place are most interesting. There are two known mechanisms. The first occurs when a foreign substance pollutes the inner environment and prevents normal function of the genetic apparatus. The second mechanism occurs when a segment of foreign DNA is incorporated into the fruit fly's DNA. Obviously, the foreign DNA carries genes of its parent source. Therefore, the mutation in the offspring of fruit fly is a result of the change in genetic programming. However, both possible mechanism result in the same effect--the offspring shows off a variety of uniform, external changes. To find out, specifically, which mechanism took place, it is necessary to use indirect methods.

[T. Shandala] has used, for his experiment, a weak saline solution of DNA, obtained from the nuclear polyhedrosis virus of the big, honeycomb inhabiting moth. This DNA served as the "foreign substance". The preparation was injected into 83 male fruit flies which were later allowed to mate. Some of the offspring, which showed visible defects--undeveloped, ugly wings--was chosen for genetic studies. Others of the offspring were allowed to mate, in turn, this time among themselves. The second generation of offspring underwent the same procedure. The total number of individual flies that were studied, over the three generation period, was about 30,000

At the end of the experiment, the scientist [T. Shandala] found that the selected, foreign DNA is locus specific. That is, it acts, everytime, at

the same site on the fruit flies' chromosomes. Hence, the scientist assumed, on the basis of his experimentally-established data, that he was able to integrate a piece of foreign genetic program into the hereditary, genetic program of the fruit fly. Therefore, the introduction of "corrections" or "changes" into a set of genes seems to be a fairly realistic prospect.

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13131/12955

CSO: 1840/885

EFFECTS OF PULSED MICROWAVE RADIATION ON ELECTRICAL ACTIVITY OF COMMON
SNAIL NEURONS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian
No 2, Mar-Apr 87 (manuscript received 5 Nov 84)

[Article by M. A. Bolshakov and S. I. Alekseyev, Institute of Biological
Physics, USSR Academy of Sciences, Pushchino]

[Abstract] A study was conducted on the effects of 0.9 GHz microwave field at 16 and 100 Hz frequencies on the spontaneous electrical activity of neurons (designated as BP-4) of the giant parietal ganglion of the common snail *Lymnaea stagnalis*. At 0.5 W/kg, a 16 Hz modulated frequency led to a decrease in background discharge rate, while at 2 W/kg a decrease was obtained in 30% of the cases, and an increase in 70% of the cases. At 0.5 W/kg and 100 Hz the background activity was not affected, but increased with 2 W/kg. The increase in the baseline discharge rate simulated changes commonly observed with simple heating and may be interpreted to reflect the thermal effects of microwave radiation. The reduction of the discharge rate at 0.5 W/kg remains unexplained at this time. Figures 2, references 7: 3 Russian, 4 Western.

12172/12955
CSO: 1840/854

IMMUNOBIOLOGICAL EFFECT OF MICROWAVES ON RABBITS DURING BITEMPORAL EXPOSURE

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,
No 8, Aug 86 (manuscript received 31 May 85) pp 217-219

[Article by V. M. Bogolyubov, S. B. Pershin, I. D. Frenkel, V. D. Sidorov, A. I. Galenchik, Yu. T. Ponomarev, deceased, A. S. Bobkova, S. N. Kuzmin, I. Ya. Moshiyashvili, N. N. Kozlova, Ye. G. Korovkina and Yu. V. Agibalov, Laboratory of Clinical Biochemistry and Immunology (head-Professor I. D. Frenkel), Central Scientific Research Institute of Health Resort and Physical Therapy, USSR Ministry of Health, Moscow; Moscow Scientific Research Institute of Vaccines and Serums imeni N. I. Mechnikov, USSR Ministry of Health]

[Abstract] Male rabbits (39) (wt 2.5-3 kg) were exposed to microwaves, with use of a 0.04m diameter contact ceramic emitter at 120 mW/cm², daily for 6 minutes for 10 days in the parieto-temporal region. Groups of rabbits (4) were sacrificed after 6 or 10 sessions or 10 days after the last exposure. Group 4 was the control group. Exposure to microwaves decreased the number of background hemolysin-forming cells against sheep erythrocytes to 70.9, 71.5 and 61.8 percent of the control figure. Changes of immunoglobulin level were brief. The effect of the microwaves on the parieto-temporal region was accompanied by activation of the hypothalamus-hypophyseal-adrenal system which promoted an increase of glucocorticoid function of the adrenal cortex and reduction of the thyroid function. The immunodepressive effect was persistent and prolonged in spite of stimulation of proliferative processes in the lymphoid tissue. References 8: 3 Russian, 5 Western.

2791/12955

CSO: 1840/731

BRIEFS

HEMATOLOGICAL AGENT FROM TREES--Scientists at the Wood and Timber Institute, the Siberian Branch of the USSR Academy of Sciences, have recovered a polysaccharide compound from larch resin that stimulates the renewal of blood flow in, and healing of, damaged tissues. Studies of the natural medication conducted in collaboration with scientists of the Central Scientific Research Institute of Hematology and Blood Transfusion have revealed that it possesses a lower viscosity and thus has a stronger effect upon the rehabilitation processes than certain synthetic drugs. [Text] [Moscow SOVIET UNION in English No 4, Apr 1987, p 27] 12955

CSO: 1840/753E

UDC 615.216.2:615.454.1

NEW DOSAGE FORMS OF LOCAL ANESTHETIC PIROMECAIN (BUMECAIN)

Moscow ANESTEZIOLOGIYA I REANIMATOLOGIYA in Russian No 3, May-Jun 86
(manuscript received 2 Jan 85) pp 50-52

[Article by O. F. Konobevtsev, L. A. Ivanova, V. N. Kondaurov, S. I. Zidra, T. A. Lobzhanidze, T. A. Pankrusheva, G. G. Muminova, M. A. Efendiyev and T. V. Kulazhenko, Central Institute of Advanced Training of Physicians; Central Scientific Research Institute of Stomatology, USSR Ministry of Health, Moscow]

[Abstract] New dosage forms of the local anesthetic piromecain [Bumecain] have been prepared and have undergone successful animal and clinical testing. The new dosage forms are represented by a 5% piromecain ointment, a 5% piromecain + methyluracil ointment, and a 3% piromecain + methyluracil collagen-based ointment. Each preparation was effective as an anesthetic on oral mucosa, lacking any systemic side effects. Studies with ^3H -labeled piromecain showed penetration to ^3H -labeled a depth of 4 mm in tongue tissue within a minute, followed by a 15 min period of accumulation, and a period of elimination beginning within 30 min. Effective anesthesia was 2 to 15 min in duration, with residual loss of sensation persisting for 30-40 min. These dosage forms have been approved for clinical use by the Pharmacologic Committee of the USSR Ministry of Health. References: 9 Russian.

12172/12955
CSO: 1840/1073

RESPIRATORY EFFECTS OF GENERAL KETAMINE ANESTHESIA

Moscow ANESTEZIOLOGIYA I REANIMATOLOGIYA in Russian No 3, May-Jun 86
(manuscript received 7 Jan 85) pp 54-55

[Article by D. I. Gonchar, Department of Anesthesiology and Reanimation,
Main Military Hospital, STV [expansion unknown]

[Abstract] An evaluation was conducted on the respiratory effects of general ketamine anesthesia in the case of 526 patients, ranging in age from 14 to 56 years. The uncomplicated surgical procedures were accomplished by a decrease in the respiratory rate by 2-4 breaths/min in 46% of the patients, an increase by 2-8 breaths/min in 20%, apnea in 1.7%, and 32.3% of the patients presented with no respiratory pattern change. Apnea was observed after the first i.v. or i.m. administration of ketamine (1.2-4.6 mg/kg) within 27-65 sec of administration, with a duration of 27 sec to 4 min and complete recovery of spontaneous respiratory activity. These observations demonstrate once again that the adverse effects of ketamine on the respiratory system should not be underestimated. References: 12 Russian.

12172/12955
CSO: 1840/1073

EFFECT OF MYELOPEPTIDES ON PHYSIOLOGICAL AND PATHOLOGICAL PAIN

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,
No 8, Aug 86 (manuscript received 24 Oct 85) pp 181-183

[Article by G. N. Kryzhanovskiy, R. V. Petrov, V. N. Grafova, Ye. I. Danilova, L. A. Zakharova, S. I. Igonkina, M. A. Lebedeva and A. A. Mikhaylova, Scientific Research Institute of Pathology and Pathological Physiology, USSR Academy of Medical Sciences; Institute of Immunology, USSR Ministry of Health, Moscow]

[Abstract] A study of the analgizing effect of myelopeptides in models of physiological and pathological pain used mongrel rats and Wistar rats (male, 200-220 g). The high analgesic action of the myelopeptides was demonstrated by the increase of length of the latent period of rats' response to physiological pain (hot plate test) and by suppression of severe spinal pain syndrome, produced in the dorsal horn of the spinal cord by a generator of pathologically-enhanced excitation. The myelopeptides produced analgesia comparable to that produced by morphine or promedol and did not cause side effects such as muscle relaxation or the narcotic effect seen in most opiate analgesics. Myelopeptides were recommended for clinical use. Figures 2, references: 8 Russian

2791/12955
CSO: 1840/731

EFFECTS OF PHOSPHOLIPASE A₂ (I) AND ORIENTOTOXIN (II) COMPONENTS OF GIANT HORNET VENOM ON RESPIRATION AND OXIDATIVE PHOSPHORYLATION OF MITOCHONDRIA

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 3, May-Jun 86
(manuscript received 14 Oct 85) pp 5-7

[Article by M. U. Tychibayev, K. T. Almatov, N. U. Akhmedova, A. I. Gagelgans and B. A. Tashmukhamedov, Institute of Physiology, Uzbek SSR Academy of Sciences]

[Abstract] In vitro studies with I and II demonstrated that these agents, which are extracted from the venom of the giant hornet (*Vespa orientalis*), depress respiration of mitochondria isolated from rat liver, and uncouple oxidative phosphorylation in the presence of succinate. Studies with media supplemented with glutamate showed qualitatively-analogous but less-pronounced changes, further demonstrating that the effects of I and II were due to their action on succinate dehydrogenase. Although I and II enhanced succinate dehydrogenase activity, the kinetics were different. Thus, both factors were shown to act on mitochondrial membranes, and may be useful reagents in studies on this class of biomembranes. Figures 1, references 5: 4 Russian, 1 Western.

12172/12955
CSO: 1840/1122

MECHANISM OF TRANQUILIZING ACTION OF STRUCTURAL ANALOGS OF NICOTINAMIDE

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 3, Mar 86 (manuscript received 20 Aug 85) pp 329-331

[Article by R. A. Akhundov, V. V. Rozhanets, T. A. Voronina and A. V. Valdman, Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow]

[Abstract] Experimental trials on outbred rats demonstrated that nicotinamide and inosine exerted anxiolytic effects in concentrations of 250-500 mg/kg, i.p., whereas two analogs of nicotinamide, designated NMF and AzN, were effective to the same extent in a concentration of 20 mg/kg. The tranquilizing effects of these agents were diminished by the administration of bicucullin and thiosemicarbazide, and by the specific benzodiazepine antagonist Ro 15-1788. Furthermore, the anxiolytic effectiveness was potentiated by the administration of calcium valproate. These observations demonstrated that the tranquilizing effects of inosine, nicotinamide, NMF and AzN were mediated by GABA receptors. The greater effectiveness of the nicotinamide congeners NMF and AzN was apparently due to their slower metabolic transformation. Figures 1, references 14: 10 Russian, 4 Western.

12172/12955
CSO: 1840/1119

EFFECTS OF BUTIFOS ON HEPATIC MITOCHONDRIA IN RATS

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 2, Mar-Apr 87
(manuscript received 17 Jan 85) pp 60-62

[Article by K. R. Ochilov, M. I. Asrarov, Kh. M. Mamatkulov, A. I. Gagelgans and A. K. Mirakhmedov, Institute of Biochemistry, Uzbek SSR Academy of Sciences]

[Abstract] The toxic effects of butifos were studied in an in vitro system using isolated rat hepatic mitochondria and in an in vivo system relying on rabbit embryos. High concentrations of butifos (ca. 10^{-4} M) led to dissociation of oxidative phosphorylation in the mitochondria in both systems. Concomitantly, butifos acted to promote mitochondrial swelling in isoosmotic NH_4^+ , Ca^{2+} , and K^+ solutions, as well as in salt-free sucrose solutions. These observations indicated that butifos acts to disrupt membrane structure, and that these detergent-like effects are responsible for its effects on mitochondrial respiration and oxidative phosphorylation. Figures 2, references 6: 3 Russian, 3 Western.

12172/12955
CSO: 1840/859

UDC 612.825.015.3.014.46:[577.175.822+577.175.852/.853

MODULATING EFFECT OF ANGIOTENSIN-II AND BRADYKININ ON TRANSMITTER SENSITIVITY OF CENTRAL NEURONS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 8, Aug 86 (manuscript received 3 Jul 85) pp 136-139

[Article by Yu. Z. Anisimov, Laboratory of Molecular Neurophysiology and Biochemistry (head - Doctor of Medical Sciences V. V. Sherstnev), Institute of Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences, Moscow]

[Abstract] A study of the effect of endogeneous neuropeptides, angiotensin II and bradykinin, on the chemical sensitivity of neurons of the sensomotor region of the cerebral cortex neurons to the mediators noradrenaline and acetylcholine involved experiments on male rabbits (2.5-3 kg weight), not narcotized, without use of muscle relaxants and slightly restrained. The neurons reacted to the substances by a change (increase or decrease) of frequency of pulsed activity by at least 30 percent in comparison with the initial background frequency and by the stability of patterns of nerve cell responses during repeated supplies of the substances. Data characterizing the reaction of 82 neurons of the sensomotor region of the rabbit cerebral cortex to microionophoretic application of angiotensin II, bradykinin, acetylcholine and noradrenaline were tabulated and presented. A pronounced functional interaction of angiotensin II and bradykinin with the mediators acetylcholine and noradrenaline at the level of the central neurons indicated that the neuropeptides predominantly amplify and prolong the reaction of the nerve cells to these mediators. It was assumed that, at the level of the central neurons, angiotensin and bradykinin may be synaptic, polytransmitter neuromodulators. Figures 2, references 11: 2 Russian, 9 Western.

2791/12955

CSO: 1840/731

EFFECT OF TUFTSIN ON ACTIVITY OF BRAIN MONOAMINE OXIDASE AND
ACETYLCHOLINESTERASE

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,
No 8, Aug 86 (manuscript received 17 Jan 86) pp 155-157

[Article by Ye. L. Dovedova, Laboratory of Cytochemistry, Brain Institute
of the All-Union Scientific Research Center of Mental Health, USSR Academy
of Medical Sciences, Moscow]

[Abstract] Tuftsin was injected intraperitoneally (300 ug/kg of body weight) in 60 rabbits (weight 1.5-2 kg) while control animals received physiological solution. Thirty and 75 minutes and 3 days after a single injection of tuftsin, the rabbits were decapitated and the sensomotor region of the cerebral cortex and the nucleus caudatus were studied. Activity of acetylcholinesterase and molecular forms of monoamine oxidase type A and type B was determined spectrophotometrically in subfractions of synaptic membranes of "light" and "heavy" synaptosomes and mitochondria, isolated from the brain formations. Tuftsin injection caused a rapid effect on metabolism of such transmitters as catecholamines and serotonin. It produced suppression of the level of utilization of serotonin which may cause accumulation of the transmitter. The effect of tuftsin on the catecholamine aminergic systems indicated that use of tuftsin compensates for exhaustion of neurotransmitters, especially dopamine, and may be significant in pathological states of the central nervous system, especially Parkinsonism. Change of activity of enzymic systems by tuftsin did not produce clear-cut shifts in level of biogenic amines and their metabolites. Tuftsin selectively modulates functions related to biologically active substances in subcellular structures of the brain. Figure 1, references 18: 16 Russian, 2 Western.

2791/12955
CSO: 1840/731

EFFECT OF THYROLIBERIN ON RAT BRAIN OPIATE RECEPTORS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,
No 8, Aug 86 (manuscript received 26 Dec 85) pp 174-176

[Article by A. M. Balashov and M. R. Shchurin, Laboratory of Neurochemistry of Alcoholisms and Narcomania (director, Professor L. F. Panchenko), All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy, Moscow]

[Abstract] It was recently established that thyroliberin hormone [TRH] is an antagonist of morphine, cutting off its depressing effect on respiration and reducing its analgesic effect. The capacity of TRH to interact

with rat mid-brain and hypothalamus opiate receptors was studied in experiments on 200-220 g male rats. Competitive displacement analysis showed that TRH in concentrations up to 10^{-5} M in vitro did not replace labelled opiate peptides in opiate receptor binding sites. An insignificant decrease of specific binding of markers was seen only after an increase of TRH concentration up to 10^{-4} M. concentrations of TRH of 10^{-8} - 10^{-6} M increased activation of specific binding of the opiate peptides by 10-20 percent, suggesting a possible change of affinity of the opiate receptors. The affinity of low-affinity binding sites was discussed. There was assumed to be an interconnection between the opiate systems and TRH while the antagonistic properties of TRH are mediated by modulation of the binding characteristics of enkephalin-low-affinity receptors. Figure 1, references 14: 4 Russian, 10 Western.

2791/12955

CSO: 1840/731

UDC 591.864:591.543.42

SPECIFICS OF ULTRASTRUCTURAL ORGANIZATION OF CARDIOMYOCYTE SARCOLEMA IN HIBERNATING ANIMALS

[Article by G. F. Zhegunov, Institute of Problems of Cryobiology and Cryomedicine, UkSSR Academy of Sciences, Kharkov]

Leningrad TSITOLOGIYA in Russian Vol 29, No 5, May 87 (manuscript received 25 Mar 86) pp 596-599

[Abstract] It has been shown that during hibernation, the basal layer of the plasmatic membranes of heart cells thickens, the ultrastructure of intercalary disks is altered and there is an increase in the saturation of each unit volume of myofibrills of the organelles. This article presents a study of the structure of the plasmalemma of the myocardial cells of hibernants, alert and active ground squirrels, as well as an explanation of the mechanism of changes in the properties of the structure during awakening of the hibernating mammals. A possible path of restructuring of the plasmatic membranes of heart cells of ground squirrels and changes in their properties in the hibernation-waking cycle is demonstrated. The possibility is shown of occurrence of synthetic processes at low temperatures in cardiomyocytes of alert ground squirrels. In addition to the cell properties arising as the ground squirrels prepare for hibernation, which do not change during the hibernation season, there are apparently cyclical changes in the structure and functioning of the plasmalemma during periodic alert periods. The specifics of ultrastructural organization of the cardiomyocytes of hibernants are primarily related to the properties of the sarcolemma, which may be of significance in providing high functional activity of the cells over a broad range of temperature. Figures 3, references 16: 11 Russian, 5 Western.

6508/12955

CSO: 1840/843

DAILY DYNAMICS OF SOME PHYSIOLOGICAL INDICATORS OF MAN UNDER DESERT CONDITION

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR. SERIYA BIOLOGICHESKIKH NAUK in Russian No 6, Nov-Dec 86 (manuscript received 13 May 86) pp 50-57

[Article by A. I. Freynk, K. Amannepesov, G. F. Sultanov, Ya. G. Garlyyev and A. A. Amiyants, Institute of Physiology and Experimental Pathology of the Desert, Turkmen SSR Academy of Sciences]

[Abstract] The need to develop reliable recommendations for organization of rest and work regimes and to define safe limits of stress for maintaining health under desert conditions prompted a study of orthostatic stability in a group of healthy inhabitants, acclimated to desert conditions. Studies performed at the desert proving ground of the Turkmen SSR Academy of Sciences Institute of Physiology and Experimental Pathology in July-August involved 11 healthy volunteer Turkmenistan inhabitants. The studies showed significant daily variations in indicators of heat-exchange, gas-exchange and of the cardio-vascular system in the subjects. The period between 1200 and 1800 was a period of high stress on all regulatory systems due to heat stress. The healthy subjects were able, with slight rest, to implement regulatory mechanisms to compensate for the effect of high temperatures. The extreme effect of high temperature increased with increased physical exertion and was manifested by decrease of orthostatic stability in the hot hours. Subjects were not dehydrated. The extreme effect of temperature increased under additional physical exertion as shown by the decrease of orthostatic stability in the hot hours. Figures 2, references 21: 15 Russians, 6 Western.

2791/12955
CSO: 1840/676

EFFECTS OF ACTH FRAGMENTS ON AGGRESSIVE AND DEFENSIVE BEHAVIOR IN RATS

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I. M. SECHENOVA in Russian Vol 72, No 12, Dec 86 (manuscript received 25 Feb 86) pp 1614-1618

[Article by L. A. Severyanova and D. V. Plotnikov, Chair of Physiology, State Medical Institute, Kursk]

[Abstract] Wistar rats (180-250 g) were employed in a study designed to further assess the behavioral effects of ACTH and its fragments in terms of aggressive-defensive responses. Intraperitoneal administration of ACTH₄₋₁₀ and ACTH₅₋₁₀ in doses of 50 and 150 µg/kg enhanced the aggressive-defensive response to unavoidable painful stimuli (electric foot shock) on an equivalent basis with that obtained with ACTH itself. Neuropharmacologic experiments demonstrated that the effects of ACTH₄₋₁₀ were attenuated in situations

when the M-cholinoreceptors of the brain were blocked; however, M-agonists potentiated the effects obtained with ACTH₄₋₁₀. These observations indicated that the mechanism of action of ACTH₄₋₁₀ involve facilitation of muscarinic receptor activation. Figures 3, references 19: 7 Russian, 12 Western.

12172/12955
CSO: 1840/798

UDC 612.843.3.014.45

EFFECTS OF NOISE ON LIGHT SENSITIVITY OF CENTRAL AND PERIPHERAL SEGMENTS OF RETINA

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 2, Feb 86 (manuscript received 15 Apr 85) pp 133-135

[Article by I. N. Dantsig and A. V. Diyevev, Department of Forensic Hygiene, Scientific Research Institute of Water Transportation, USSR Ministry of Health, Moscow]

[Abstract] An analysis was conducted on the effects of white noise (95 dB; 1 h exposure) on retinal light sensitivity in 31 young men (20-25 years) with normal vision. The analytical data were based on changes in dark adaptation threshold (DAT) and visual acuity recovery time (VART). On the basis of the result four fundamental response patterns were delineated. One group of individuals responded with an increase in both DAT (by 38%) and VART (27%), another group showed a decrease in DAT (by 58%) and an increase in VART (by 36%), and a third cohort demonstrated an increase in DAT (by 69%) and a decrease in VART (by 48%). Finally, a fourth group of subjects showed no changes either in the DAT or the VART parameter. These observations demonstrated that white noise may have variable effects on retinal VART and DAT characteristics, depending on the individual functional characteristics of the CNS. Figures 1, references: 12 Russian.

12172/12955
CSO: 1840/1118

INFRADIAN BIORHYTHMS OF HUMAN VITAL SIGNS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 33, No 2, Mar-Apr 87 (manuscript received 7 Mar 85) pp 10-15

[Article by N. N. Shabatura, V. G. Tkachuk, V. A. Fedko and S. B. Paliyenko, Kiev Pedagogical Institute imeni A. M. Gorky, Ukrainian SSR Ministry of Education]

[Abstract] Biorhythmic patterns were evaluated for a number of conventional vital signs in the case of 20 men, 20-24 years old, including two with neuromuscular disorders. The data led to the identification of two fundamental infradian patterns of activity, consisting of a circaseptadian rhythm (6.5 ± 0.3 days) and, in the case of body temperature an additional circadi-septadian rhythm (13.0 ± 0.5 days). The longitudinal measurements were carried out over a 60-620 day period, demonstrating that social factors -- while affecting vital sign biorhythms -- do not have a primary role in their generation. Generation of the infradian rhythms appears to depend exclusively on endogenous mechanisms. Figures 2, references 14: 10 Russian, 4 Western.

12172/12955

CSO: 1840/779

UDC 612.014.4

PHYSICOCHEMICAL CORRELATES OF HUMAN ADAPTATION TO EXTREME ENVIRONMENTS

Moscow IZVESTIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKAYA in Russian No 1, Jan-Feb 87 (manuscript received 8 May 86) pp 104-118

[Article by A. F. Konkova, I. A. Magay, O. M. Shekhayeva, V. F. Sokolov and M. N. Anufriyeva, Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] A discussion is presented of the energetics involved in maintaining viable homeostasis while the human body is exposed to extreme environmental factors. The self-adjustment in metabolic processes is shown to be of such nature as to maintain critical parameters within a narrow range, with ΔQ_i -- heat production -- serving as the criterion of adjustment. Even on initial stages of exposure or anticipated exposure to different environmental factors, energy production would increase 2- to 5-fold above the level of basal metabolism. The extent of changes during the transitional change in the process of adaptation to a new level of functional status reflects the overall stability of the system and its flexibility. The increase in the internal energy of the system represents the adaptability of the system. Studies on nine healthy athletes demonstrated that the system adjusts to maintain vital parameters, eg., pH, temperature, acid-base balance, within a narrow range while functioning in the most optimal regime. Figures 7, references 14: 1 Hungarian, 10 Russian, 3 Western.

12172/12955

CSO: 1840/853

EDUCATED NEURONS AND BRAIN FUNCTION

Moscow NTR: PROBLEMY I RESHENIYA in Russian No 10, 19 May-1 Jun 87, p 3

[Article by I. Ivanov 'Educated Neuron'. First two paragraphs are introductory in sources]

[Text] The belief up to now has been that only those centers of the brain responsible for a given function actually "work" during specific kinds of human activity while other centers "rest".

Moscow State Universtiy imeni M. V. Lomonosov physiologist Professor B. I. Kotlyar rejects this firmly rooted concept.

"Experimental data tell us that there are no neurons which would not react to whatever event might be ongoing in different parts of the brain", explains Professor Kotlyar. "Constantly taking shape in the brain are so-called functional states--networks of neurons that are "interlinked", each in their own special way. What this means is that all activity taking place in the brain is nothing more than a process in which the states of the brain continuously change one after the other. Qualitatively new functional states specific to each type of human activity are the product of this activity."

Working from these premises, Professor Kotlyar asserts that the experience amassed during the life of an individual -- his or her knowledge -- is a function of the number of states remembered by the brain and, talent is the ability of the brain, with sufficient speed, to form a host of new states and to "remember" old ones. Only the brain, and how well it classifies types of activity, determines the creative and adaptive ability of man.

These ideas were the motivating factor behind the entire series of experiments currently under way in the Biology Faculty of Moscow State University. In particular, established for the first time, was the capacity of an individual neuron for training and associative activity.

"It may be possible, even in the very near future, to apply in "medicine" the new knowledge gained about neurons, believes B. I. Kotlyar. "By acting on them in specific ways, brain cells can be stimulated, 're-educated' in an effort to heal several neural diseases".

The functional polymorphism theory for the brain may also help those involved in the design of "artificial intelligence", which can only be modeled after the mechanism of cranial activity. The drawback to modern day fourth and even fifth generation computers lies in the fact that their storage media cannot be altered by information. And, an "artificial intellect" should be based on functional memory blocks which, just as neurons, are able to decide just what needs to be remembered and what not according to a specific program.

13287/12955
CS0: 1840/888

BRIEFS

MULTIPROFILE CHILDREN'S HOSPITAL IN MOSCOW--(TASS)--In Southwest Moscow construction has begun on a multiprofile republic children's clinical hospital. The location was not chosen at random. The medical buildings are being erected in the region of the very purest air of the capital. The new clinical is designed to receive thousands of patients. A surgical department with 300 beds is already operating. Experienced microsurgeons, oncologists, nephrologists, otolaryngologists, and specialists of other medical disciplines are working here. Work in the clinic is carried on in close collaboration with the Department of Children's Surgery and Orthopedics of Medical Institute No 2 imeni N. I. Pirogov. The consultants include many doctors and candidates of medical sciences. Modern equipment makes it possible to carry out unique microsurgical operations, and to make broad use of magnets for sutureless joining of tissues after traumas. For the littlest patients, comfortable cubicles are provided where babies can be together with their mothers. In the playrooms, children have at their disposal a great variety of toys and visual aids. An educator-pedagogue will conduct lessons for them. Construction is continuing on the little town of health. Departments are being put together and fitted out with the latest technology. [Text] [Moscow VECHERNYAY MOSKVA in Russian 7 Feb 87 p 2] 12255

CSO: 1840/515

UDC 616.133.33-084.3:669

PREVENTION OF CEREBROVASCULAR DISEASE IN MASS SCREENING OF WORKERS

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 11, Nov 86 (manuscript received 28 Apr 86) pp 17-20

[Article by B. A. Kistenev, L. S. Manvelov and A. Z. Vostrikov, Scientific Research Institute of Neurology, USSR Academy of Medical Sciences; Lipetsk Oblast Health Department]

[Abstract] Beginning with 1984, a mass medical screening (dispensarization) program was organized at the Novolipetsk Metallurgical Complex imeni Yu. V. Andropov with particular attention to cerebrovascular risk. The resultant clinical data were analyzed on a SM-4 computer, using a Zdorovye program. Examination of 27,727 workers has revealed an incidence of hypertension of 11.67%, with most of the workers falling into the at-risk category presenting with initial stages of cerebrovascular insufficiency. This cohort is subject to biannual examinations and individualized physical and medicinal treatment regimens. Furthermore, individuals failing to show a reduction in blood pressure in the preliminary stages are hospitalized for more complete diagnostic and therapeutic work-ups. References: 8 Russian.

12172/12955

CSO: 1840/835

MULTIDISCIPLINARY DIAGNOSTIC CENTER: PROSPECTIVE FUTURE FORM OF HEALTH CARE DELIVERY

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 11, Nov 86 (manuscript received 19 Jun 86) pp 20-24

[Article by E. S. Gabriyelyan, I. R. Golubev, G. A. Nikogosyan, A. A. Ordukhanyan, V. S. Armenakyan and E. S. Torosyan, USSR State Committee for Science and Technology; Armenian SSR Ministry of Health, Yerevan]

[Abstract] A multidisciplinary diagnostic center has been established in the Armenian SSR as an approach to an efficient and an authoritative diagnostic component of the total health care spectrum. The purpose was to concentrate both physical resources and human expertise in a single site that could provide responsive services to a wide assortment of surrounding medical facilities. As presently structured, the center encompasses 8 laboratories specializing in various forms of functional and laboratory assessment. In the first 2 years of its existence the center has processed some 1600-1700 patients per day, and conducted some 5000-6000 diagnostic (3-4 per patient) studies on a daily basis. Anticipated improvements in the center include a further emphasis on automation, formation of a diagnostic data bank, and the establishment of three regional branches. The center, as currently formulated, may well serve as a prototype of diagnostic medicine in the future and in important component of the mass screening program. Figure 1.

12172/12955
CSO: 1840/835

UDC 364.444:656.566]:65.012.2(574)

ASSESSMENT OF PHYSICAL PLANTS AND EQUIPMENT OF POLYCLINICS AS INFORMATIONAL RESOURCE FOR HEALTH PLANNING

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 11, Nov 86 (manuscript received 31 Mar 86) pp 24-26

[Article by V. I. Vyushkov, M. K. Kulzhanov, candidate of medical sciences, B. K. Kerimbekov, doctor of medical sciences, V. A. Korzun, candidate of medical sciences, E. A. Pak, M. T. Alishpanova, Yu. I. Eydinov and Zh. Zhakashov, candidate of medical sciences]

[Abstract] An analysis was conducted on the 2683 polyclinics in the Kazakh SSR to assess the current status of this aspect of health care in the republic, and to provide a foundation for health planning in the future. The data under analysis represented findings for the 1970-1984 period. They revealed that the polyclinics tended to be concentrated in certain areas, showing the need for decentralization. In addition, the patient load was

also unevenly distributed leading to overuse of some facilities and neglect of others. Other problems that need immediate attention are those related to aging physical plants, inadequate size, and the need for automation and updating of laboratory and clinical instruments. Such facts and needs should be taken into consideration in anticipating future needs in the health care sector in the Kazakh SSR.

12172/12955
CSO: 1840/835

UDC 616-082-039.57:65.012.2

AUTOMATED SYSTEM FOR PREDICTING PATIENT FLOW AT POLYCLINICS

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 11, Nov 86 (manuscript received 5 Feb 86) pp 26-29

[Article by L. I. Ramzanov, M. G. Fomina, V. A. Khizhnyak and Yu. S. Khodorenko]

[Abstract] A computer-based system, devised for analyzing patient flow at polyclinics, demonstrated that ca. 34-38% of the patients are present between 8 and 10 am. An additional 12-17% of the daily visits fall between 12 and 2 pm, with the frequency of patient visits decreasing thereafter during the day. Application of that type of information to the No 2 Polyclinic of the No 18 City Hospital in Dnepropetrovsk led to a marked improvement and efficiency in health care delivery. This form of statistical analysis facilitated efficient patient load-related staffing with medical personnel on a specialty basis. Information on patient flow is updated periodically in order to monitor changes in patient habits and needs, and to make the appropriate changes at the operational level of the clinic. References: 2 Russian.

12172/12955
CSO: 1840/835

HEALTH STATUS OF FEMALE WORKERS IN ELECTROPLATING SHOPS IN MACHINE
CONSTRUCTION INDUSTRY

Kiev VRACHEBNOYEDELO in Russian No 7, Jul 86 (manuscript received 23 May 85)
pp 104-106

[Article by A. I. Kleyner, L. P. Solovyeva, G. Ye. Artemenko, Z. F. Nestrugina, I. Ya. Getmanets, V. A. Yefremova and I. I. Yermilova, Department of Occupational Pathology, Kharkov Scientific Research Institute of Labor Hygiene and Occupational Diseases]

[Abstract] A comparative evaluation of health status was conducted on 143 women employed in an electroplating shop and on 100 control women, in order to assess the health risk of the occupational environment. The resultant data demonstrated that the incidence of internal diseases for both groups was virtually identical, 37% for the experimental group and 35% for the control group. However, the incidence of nasal mucosal disorders was significantly higher in the experimental group (25%) than in the control group (2%). Similarly, the incidence of gynecologic diseases (42%) was twice as high among the experimental women as among the control group of women (20%). In addition, the experimental group was characterized by a high incidence of complications in the first and second half of pregnancy, 43 and 60%, respectively, versus corresponding figures of 15 and 40% for the control group. These observations point to the urgent need for improving the hygienic aspects of women workers employed in electroplating shops. References: 7 Russian.

12172/12955
CSO: 1840/1127

UDC 362.147

SUCCESS AND PROBLEMS OF POPULATION BASED SCREENING PROGRAM IN GRODNO BLAST

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 9, Sep 86 (manuscript received 8 Jul 86) pp 5-9

[Article by V. M. Zalesskiy, Minsk]

[Abstract] In its effort to improve overall health status of the Soviet population, the Party stresses prevention as the principal mechanism towards this goal. Until recent times, only 43% of the population was captured by annual medical examinations (dispensarization) and only 20% were routinely seen by medical personnel for preventive measures. In 1983, the Party decided to extend the annual health examinations to the entire population. This health examination was defined as a method of early detection of diseases and risk factors (premorbid states), timely treatment, dynamic follow up, preservation of labor force and development of upcoming

generations. The author believes that the term "annual" is not applicable in this case. In Grodno, about 96% of the population was examined by 1986. Six groups were identified among them: healthy: 19.3%; almost healthy: 13.5%; chronically ill (CI) in a state of subcompensation: 8%; CI in a compensation state: 56.6%; CI in decompensation state: 2% and those who had survived serious diseases: 0.6%. A network of examination stations and central files was established. Automated data processing was introduced allowing quick analysis of massive input from various forms and questionnaires. Experimentation with a "health passport" was underway but no conclusive result were as yet available. References: 17 Russian.

7813/12955
CSO: 1840/1121

UDC 617.7-053.9:362.147

OPHTHALMOGERIATRICS AND PROBLEMS OF MASS SCREENING PROGRAM

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 2, 1987 (manuscript received 23 Dec 86) pp 65-68

[Article by L. T. Kashintseva, professor, Odessa Order of Labor Red Banner Scientific Research Institute of Eye Diseases and Tissue Therapy, imeni Academician V. P. Filatov]

[Abstract] In the Ukraine, 37% of urban and 22% of rural senior citizens have consulted an ophthalmologist, the most frequent causes being corneal pathology, anomalies in refraction, glaucoma and conjunctival diseases. In eye disease hospitals, 27% of the patients are senior citizens, most frequently due to corneal pathology, glaucoma, diseases of the retina, blood vessels and optic nerve. Seniors frequently have two or three eye diseases simultaneously. Relative frequencies are presented. Older citizens, not members of organized collectives, frequently are not examined on a routine basis, so that patients often come to the ophthalmologist with mature cataracts in both eyes, absolute glaucoma in one eye and developing glaucoma in the other eye, terminal stages of maculodystrophy, developed neoplasms etc. With the aging of the population which is now occurring, provision of timely mass screening (dispensarization), services for this age group is increasingly important. References: 15 Russian.

6508/12955
CSO: 1840/852

ADMINISTRATIVE ASPECTS OF YEARLY MASS HEALTH SCREENING IN LENINGRAD

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 8, Aug 86 (manuscript received 22 Oct 85) pp 14-18

[Article by G. A. Zaytsev, V. A. Minyayev, I. V. Polyakov and L. A. Alekseyeva, Main Administration of Health of the Ispolkom, Lensovet; 1st Leningrad Medical Institute imeni I. P. Pavlov]

[Abstract] A review is provided of the administrative and medical measures taken in Leningrad to secure mass health screening (dispensarization). Following completion of the census, the data were used to formulate plans for mass screening at preventive medicine outpatient facilities. On the basis of the collated data on the adult and pediatric segments of the population, the entire population was classified into three categories on the basis of health status. Group I consisted of healthy individuals, Group II of at risk individuals, and Group III of sick individuals. The latter group was further subdivided into those in a convalescent state, those with chronic but non incapacitating conditions, those with chronic illness and partially incapacitated, and those that are unable to work because of their medical state. Group I category encompassed 17% of the individuals that underwent the mass screening, as did Group II. Group III was represented by 66% of the cohort.

12172/12955
CSO: 1840/1103

UDC 616-084.3:364.444

HOSPITAL INVOLVEMENT IN ANNUAL MASS HEALTH SCREENING

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 8, Aug 86 (manuscript received 5 Nov 85) pp 18-22

[Article by V. A. Moyseyev, Voronezh]

[Abstract] Active involvement of hospitals in the Soviet mass screening (dispensarization) program would have beneficial effects in that duplication of effort could be avoided, and individuals that might otherwise escape screening would be covered. The experience of the No 8 City Hospital in Voronezh is recounted, together with the educational measures for the medical personnel and the patients. This approach represented an efficient method for screening some 11,000 individuals that otherwise would have had to undergo screening at other facilities. Expansion of this approach to other localities and hospitals would constitute a valuable and cost-effective adjunct to the mass screening program.

12172/12955
CSO: 1840/1103

COMPUTERIZED CARTOGRAPHY FOR ASSESSING HEALTH STATUS IN SOVIET FAR NORTHEAST

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 8, Aug 86, pp 37-39

[Article by A. B. Kosolapov and A. V. Koshkarev, Pacific Ocean Institute of Geography, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok]

[Abstract] Computer-generated maps of disease patterns in the northeastern regions of the Soviet Far East were used to analyze the temporospatial variability of health risk factors, morbidity, and demographic features. The studies, relying on the ES series of computers, compared computerized cartography with that generated by conventional means with statistical data for the various areas and demonstrated the superiority of computer-generated maps in reflecting the plasticity of the 'statistical relief' of the territories in question. The computerized approach made possible rapid differentiation of the different areas as to general health status and variability in morbidity. References: 5 Russian.

12172/12955

CSO: 1840/1103

UDC 617-7-616-362.142(575.4)

OPHTHALMOLOGICAL MASS SCREENING IN TURKMEN SSR GAS INDUSTRY

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 2, Feb 86, pp 3-5

[Article by R. Kh. Khakkiyev, A. N. Maksimenko, A. N. Afanasyeva, Sh. A. Amansakhatov, E. K. Tsereteli, A. Ch. Nurmukhamedov, S. N. Berenov, A. Ch. Charyyeva and G. O. Ozzyyev, Turkmen Scientific Research Institute of Eye Diseases]

[Abstract] Ophthalmological mass screening (dispensarization) of 496 workers of the Turkmenyuzhburgaz Industrial Association in the Turkmen SSR in 1984 revealed that the highest incidence of pathology was attributable to refractive errors, malignancies, conjunctivitis, and pterygium. A breakdown on the 156 individuals with any type of ocular or visual pathology showed an incidence of 16.8% for myopia and myopic astigmatism, 15.3% for hypermetropia and hypermetropic astigmatism, 18.6% for conjunctivitis, 29.4% for neoplasia, 12.2% for pterygium, and 2.6% for cataracts. Tonometry on 216 individuals older than 30 years revealed ocular hypertension in 3 individuals, representing 0.6% of the total cohort or 1.4% of those subjected to tonometry. On an overall basis, approximately 30% of the gas workers were shown to have some kind of ocular pathology. References: 5 Russian.

12172/12955

CSO: 1840/1086

ACUTE PROBLEMS IN ANTIALCOHOLISM PROPAGANDA

Moscow KLINICHESKAYA MEDITSINA in Russian No 7, Jul 86 (manuscript received 9 Dec 85) pp 125-127

[Article by F. K. Shumakov, Tashkent]

[Abstract] The failure of antialcoholism propaganda and campaigns is often due to the fact that physicians themselves do not believe in their effectiveness, and the fact that such efforts are poorly organized and contradictory. One lecturer may stress the fact that alcoholism is a social problem, another that it is an organic disease, and yet another that it is a bad habit that can be broken by exerting a little will power. This creates confusion among laborers and workers, particularly when films designed for mass distribution as an antialcoholic vehicle features 'alcoholic' actors in sympathetic roles. A concrete and well-conceived and planned campaign must be launched to overcome these shortcomings and the existing social pressures. The workers must be made aware of the tremendous economic losses that the USSR suffers as a result of alcoholism, and of the resolute measures that must be taken to rectify this situation for the good of society and the individual.

12172/12955
CSO: 1840/1095

UDC 614.27(470)"1976-1980""1981-1985"

ORGANIZATION OF PHARMACY SERVICES IN RSFSR IN 10th AND 11th FIVE-YEAR PLANS

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 12, Dec 86 (manuscript received 17 Feb 86) pp 22-26

[Article by V. G. Popov]

[Abstract] An analysis was conducted on the progress and development in the various aspects of pharmacy services in the RSFSR during the 10th and the 11th Five-Year Plans, in order to provide a basis for developments in the 12th Five-Year Plan. In the time period in question the data showed both an increase in the numbers of pharmacies and pharmacists, as well as an understable and expected increase in drug dispensing activity. The number of pharmacy collectives and individual pharmacists receiving awards and commendations for performance has also increased, pointing to promising developments in the future. However, the collated information also revealed the need for more postgraduate training and instillation of professional ethics, as well as for greater care to the availability of drugs. The pharmacists should be educated in the use of generics over patented drug nomenclature, and trained to educate their clients in the seriousness of

unnecessary reliance on drugs. Furthermore, more care and attention should be accorded to the efficiency of the pharmacy services and the avoidance of excessive reliance on drugs that are in short supply.

12172/12955
CSO: 1840/836

UDC 364.444:364.65-053.31

SOCIAL AND HYGIENIC EVALUATION OF HEALTH STATUS INDICATORS OF NEWBORN IN PERINATAL PERIOD

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 12, Dec 86 (manuscript received 8 Jul 86) pp 31-37

[Article by R. K. Ignatyeva, candidate of medical sciences, and N. I. Kaderkayeva, All-Union Scientific Research Institute of Social Hygiene and Public Health Administration imeni N. A. Semashko, USSR Ministry of Health, Moscow]

[Abstract] An analysis was conducted on 6041 neonates born in Lipetsk in 1979 to assess their health status in the perinatal period. The basic data demonstrated that the incidence of premature births was 5.2%, 6.6% of the births were overdue, that 4.3% of the infants were below 2500 g in weight at birth, and that 16.2% were more than 4000 g in weight. Data are also presented on the distribution of Apgar scores within 1 min of birth, as well as after 5 min. The tabulated data demonstrated that 78.5% of the children were born healthy and remained well during the first week of life. On the basis of the various clinical parameters the neonates were classified into 3 categories: Group I -- healthy, Group II -- healthy, but at risk, Group III -- neonates with congenital or acquired pathology. Children in Groups II and III should be visited at home by the uchastok physician within a day of discharge from the hospital. References:
11 Russian.

12172/12955
CSO: 1840/836

MEDICAL SCREENING IN VOLGOGRAD OBLAST

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 7, Jul 86
(manuscript received 9 Jan 86) pp 36-39

[Article by L. A. Gryazeva, A. P. Ushakov, A. I. Yegin, A. A. Rogov and
S. G. Frolova, Volgograd Oblast Department of Health]

[Abstract] Medical mass screening [dispensarization] in the Volgograd Oblast was carried out according to the conventional three-step approach, consisting of an initial preparatory and planning phase, followed by the second phase of actual screening, and a third phase offering follow-up and counseling. By 1984, 71.3% of the population had been screened, a figure reaching 80% in the individual rayons. The total number of individuals encompassed by this approach reached 1,080,000, in 277,714 of whom some form of pathology requiring further attention was uncovered.

12172/12955

CSO: 1840/1106

BRIEFS

COMPUTER ANALYSIS OF EMOTIONAL STATE--In the Palanga Health Resort Laboratory, an office has opened where it is possible to check the emotional state of any patient. A microcomputer assists the medical workers to do this. One signal of the psychophysiological system is the voice, which, along with intonation, gives away the emotional mood of an individual, even against his will. "For medical workers, this is very important," said the leader of the Republic Scientific-Research Laboratory of Health Resort Treatment, V. Myashka, commenting on the innovation. "Recording the patients' speech on magnetic tape over specific time intervals and analyzing it automatically, specialists put together a curve of the changes in emotional state." This objective indicator is now helping to control the process of sanatorium treatment and is making it possible to get the best effect. The program of automatic analysis of speech signals was developed by specialists in radioelectronics at the Kaunas Polytechnic Institute. Standards of various emotional states--joy, anxiety, depression, and so forth--according to voice signals were created with the help of actors from Vilnius Youth Theater. [Text] [Yerevan KOMMUNIST in Russian 8 Feb 87 p 3] 12255

CSO: 1840/515

UDC 616.831.31-018.1-02:612.014.481]-092.9:599.323.4

DYNAMICS OF EARLY ULTRASTRUCTURAL CHANGES IN RAT CEREBRAL CORTEX AS FUNCTION OF RADIATION DOSE

Leningrad ARKHIV ANATOMII, GISTOLOGII I EMBRIOLOGII in Russian Vol 92, No 2, Feb 87 (manuscript received 25 Jun 86) pp 17-23

[Article by A. A. Abdrakhmanov and V. A. Otellin, Department of Morphology (Headed by Doctor of Medical Sciences, V. A. Otellin), Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad; Department of Pharmacology (Headed by Docent R. K. Utepbergenova), Alma-Ata Medical Institute]

[Abstract] When high doses of ionizing radiation act on the body, complex ultrastructural changes--in neurons, glial elements and the microcirculatory bed--are observed in the central nervous system. This article presents the comparative analysis of early ultrastructural changes in neurons, glial elements and microcirculatory bed of the cerebral cortex upon exposure of rats to radiation of varying intensities. One group of animals was exposed to neutron bombardment at 10 Gr, total rate 0.35 Gr/min. The second group of animals received radiation at 150 Gr, dose rate 75 Gr/min. The animals were decapitated 15, 60 and 180 minutes after irradiation. The dynamics of ultrasctructural changes were found to vary with dose, with variations in depth and sequence of morphological restructuring. The response of barrier structures of the brain is quicker after 150 Gr radiation, which must be considered when it is necessary to combine radiation and chemotherapy of cancer patients or for pharmacological correction of post-radiation damage to the central nervous system. Figures 2, references 15: 9 Russian, 6 Western.

6508/12955
CSO: 1840/845

UDC 576.858

EFFECTS OF HUMAN INTERFERON ON REPRODUCTION OF PHYTO- AND MYCOVIRUSES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian
No 3, May-Jun 87 (manuscript received 14 Oct 85) pp 341-345

[Article by V. I. Ogarkov, I. G. Atebekov, I. B. Kaplan, M. E. Talyanskiy
and S. I. Malysenko, Moscow State University imeni M. V. Lomonosov]

[Abstract] In view of the similarity of human leukocytic interferon (IF) to the antiviral factor detected in tobacco leaves infected with tobacco mosaic virus, the effects of IF on the multiplication of a number of phyto- and mycoviruses were investigated. The studies demonstrated that both unfractionated IF and IF preparations obtained by recombinant technology inhibited the replication of tobacco mosaic virus, and potato X, F, Y viruses in tobacco plant cells (*Solanum tuberosum*). The degree of inhibition, as measured by ELISA determination of virus concentration, ranged from 70 to 90%, and was evident within a rather narrow IF concentration of 1 to 10 U/ml, when 8 mm disks of the infected leaf tissue were incubated in the IF solution for 2-4 days. Human IF was also demonstrated to inhibit the mycoviruses of cultivated mushrooms. Although unknown, the mechanism of action of human IF in plant systems is highly concentration dependent. Figures 1, tables 1; references 11: 1 Russian, 10 Western.

12172/12955

CSO: 1840/855

UDC 574.64:577.1.591-105

EFFECT OF POISONS IN ANTI-FOULING COATINGS ON CARBOHYDRATE METABOLISM ENZYMES
OF SOME FOULING ORGANISMS

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 22, No 6, Nov-Dec 86
(manuscript received 4 Jul 83) pp 79-82

[Article by A. Z. Shapiro and A. N. Bobkova, Institute of Biology of the
South Seas, UkSSR Academy of Sciences, Sevastopol]

[Abstract] A study of the action of 10-chlorophenoxarin (CPA), tributyl stannic oxide (TBTO), mercury dimethylthiocarbamate phenyl (felam), zinc diethylthiocarbamate (ciram), tin salicylalchloride (TSC), methylene, rhodanate and of salicylic acid anilide on Black Sea mussel *Mytilus galloprovincialis* L and barnacle *Balanus improvisus* (Darw) was determined by their effect on the carbohydrate metabolism enzyme activity. CPA and TBTO of the compounds studied inhibited the enzymic activity to the greatest extent. Similarities and differences in the effects of hypoxia and of the poisons on the activity of enzymes of glycolysis in the mussels and barnacles is discussed. There was a difference in sensitivity of both the initial and end enzymes of carbohydrate catabolism to the poisons. Figure 1, references 12: 9 Russian, 3 Western.

2791/12955
CSO: 1840/677

QUALIMETRIC EVALUATION OF SOVIET DOCUMENTAL INFORMATION FLOW ON PATENTABLE DECISIONS IN MEDICINE

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE IN Russian No 12, Dec 86 (manuscript received 9 Apr 86) pp 38-40

[Article by A. R. Uvarenko and V. G. Matusevich, Republic Center of Scientific Medical Information, Ukrainian SSR Ministry of Health; Kiev Scientific Research Institute of Tuberculosis, Pulmonology, and Chest Surgery imeni Acad. F. G. Yanovskiy]

[Abstract] An analysis was conducted on patentable inventions and discoveries in the field of medicine in the USSR over the 1960-1980 period. In that time-frame, the number of author's certificates that were granted increased 2.6-fold, while the number of patents increased more than 30-fold. Most of the patents were granted in the fields of traumatology and orthopedics (12%), pharmacy (9%), cardiovascular medicine (8.2%), surgery (6.9%), hygiene (6.7%), microbiology (5.9%), ophthalmology (5.7%), therapeutics (4.3), and stomatology (3.9%). An analysis of the descriptions demonstrated that the authors generally seek reference to Soviet analogies twice as often as to foreign accomplishments, suggesting that Soviet researchers tend to neglect foreign research. References: 4 Russian.

12172/12955

CSO: 1840/836

POSTGRADUATE TRAINING FOR CEMA BIOLOGISTS

Moscow PRAVDA in Russian 20 Jun 87 p 2

[Article by G. Alimov on Moscow University Center for Advanced Training of CEMA Students in Biotechnology]

[Text] In September, a Center for Advanced Training at the Biology Faculty of Moscow University will begin offering courses for retraining and upgrading the qualifications of specialists from CEMA members countries.

It is not surprising to find that people with higher education are back in the classroom again. The pace of contemporary science is swift. Today's discovery, barely brought to light, quickly becomes a fact of the past. And that is why the member countries of CEMA have decided to unite their efforts in one of the most progressive directions--that of biology and biotechnology.

This is a sign of times, and a further example of cooperation among the countries of the socialist community. In the past, the scientific ties between these countries consisted of the exchange of individual specialists, and the signing of collaboration agreements. This has ceased to give satisfactory effects.

The Chairman of the Council on Coordination Activity for the Advanced Training Center, Dean of the Biology Faculty of Moscow State University (MSU), Professor M. Gusev, has stated that staff retraining has become a matter of urgent necessity. He believes that the further training will proceed on an entirely new level, and according to mutual plans.

The reason for the selection of the Biology Faculty of MSU is simple. The specialists in practically all areas of biology work there. Their area of interest stretches from the studies of individual cells, at the nuclear level, to examination of cell populations on the molecular level.

The attendees of this Center will study in six disciplines, each headed by a group of leading scientists. Some of the topics of these disciplines are: "Genetics and cell engineering", "Protein and enzyme engineering", and "Technological bioengineering".

The applicants from CEMA countries will be contracted or accepted on the basis of mutual exchange. The length of retraining has been specified to be no less than two months and no greater than ten months. The first participants will be recruited from representatives of the German Democratic Republic (GDR), the Czechoslovak Socialist Republic (CSSR), Bulgaria, the Mongolian People Republic (MPR), the Socialist Republic of Viet Nam, and Cuba. The attendants from the last three countries will receive "most favorable status", i.e., their training will be free of charge. The "students" at this Center will, basically, be people with higher education, scientific associates of NII [scientific research institutes], candidates of science, or teachers...

M. Gusev has remarked that there are many people, from various institutes of our country, who wish to get into the Center. However, only those who pass a competitive examination will be selected...

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13131/12955
CSO: 1840/885

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